

**SECOND FIVE-YEAR REVIEW REPORT FOR  
MIDNITE MINE SUPERFUND SITE  
STEVENS COUNTY, WASHINGTON**



**Prepared by**

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*4/15/19*

**Date**

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## LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
Dawn	Dawn Mining Company
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
gpm	gallons per minute
IC	Institutional Control
ICIAP	Institutional Controls Implementation and Assurance Plan
µg/L	Micrograms per liter
µR/hr	Microroentgens per hour
mg/kg	Milligrams per kilogram
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
Newmont	Newmont Mining Company
NRWQC	National Recommended Water Quality Criteria
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
Pb	Lead
pCi/g	Picocuries per gram
pCi/kg	Picocuries per kilogram
pCi/L	Picocuries per liter
PRP	Potentially Responsible Party
Ra	Radium
RAO	Remedial Action Objective
RAWP	Remedial Action Workplan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SMP	Site-wide Monitoring Plan
TSP	Total Suspended Particulate
U	Uranium
U-Nat	Natural Uranium
UTL	Upper Tolerance Level
UU/UE	Unlimited Use and Unrestricted Exposure
WTP	Water Treatment Plant
WQS	Water Quality Standard



# I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the second FYR for the Midnite Mine Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of two operable units (OUs). This FYR addresses both OUs. OU1 addresses all contaminated media associated with the Mined Area (areas physically disturbed by mining) and the Mining Affected Area (gravel haul roads at or near the mine and areas affected by environmental transport of mine-related contaminants) (Figure 1). OU2 addresses the Midnite Mine Haul Route<sup>1</sup>, which includes contaminated areas along the paved public road where waste was spilled or dumped (Figure 1).

EPA remedial project manager (RPM) Joe Wallace led the FYR. Participants included EPA community involvement coordinator (CIC) Jo Gallagher, Randy Connolly, Joni Wynecoop and Ricky Sherwood of the Spokane Tribe of Indians, and EPA contractor support from Skeo. The potentially responsible parties (PRPs) were notified of the initiation of the FYR. The review began on 8/21/2018.

## **Site Background**

The Site consists of a 350-acre, inactive uranium mine and all contaminated areas affected by mine-related contaminants. It is located about 45 miles northwest of Spokane on the Spokane Indian Reservation in Wellpinit, Washington (Figure 1). The mine operated from 1955 to 1981. Contaminants at the Site include radionuclides and heavy metals mobilized as a result of mining and transport activities and environmental processes, such as acid mine drainage, radioactive decay and particulate transport in air, surface water and groundwater.

Approximately 5.3 million tons of ore and proto-ore and 33 million tons of waste rock were removed from nine pits between 1955 and 1981. About 2.4 million tons of ore and proto-ore were stockpiled on site. Waste rock was used to backfill a series of previously mined pits, construct roads and grade the Site, or was dumped in one of several waste rock piles. Pit 3 and Pit 4, the two pits mined last, were not backfilled and currently remain open although backfilling, as part of the remedy, is currently underway in Pit 4. Collected groundwater and stormwater is stored in Pit 3.

In the late 1970s, contaminated seeps were observed at the toe of the largest waste rock piles at the Site. Between 1977 and 1997, various federal agencies performed studies and issued orders requiring Dawn to intercept contaminated water and treat it prior to discharge. A seep collection system and pump-back system to collect water and direct it back to the Pollution Control Pond and then to storage in Pit 3 was built in 1986. In 1988, the Midnite Mine WTP was constructed to treat water in the open pit. The WTP began operating in 1992.

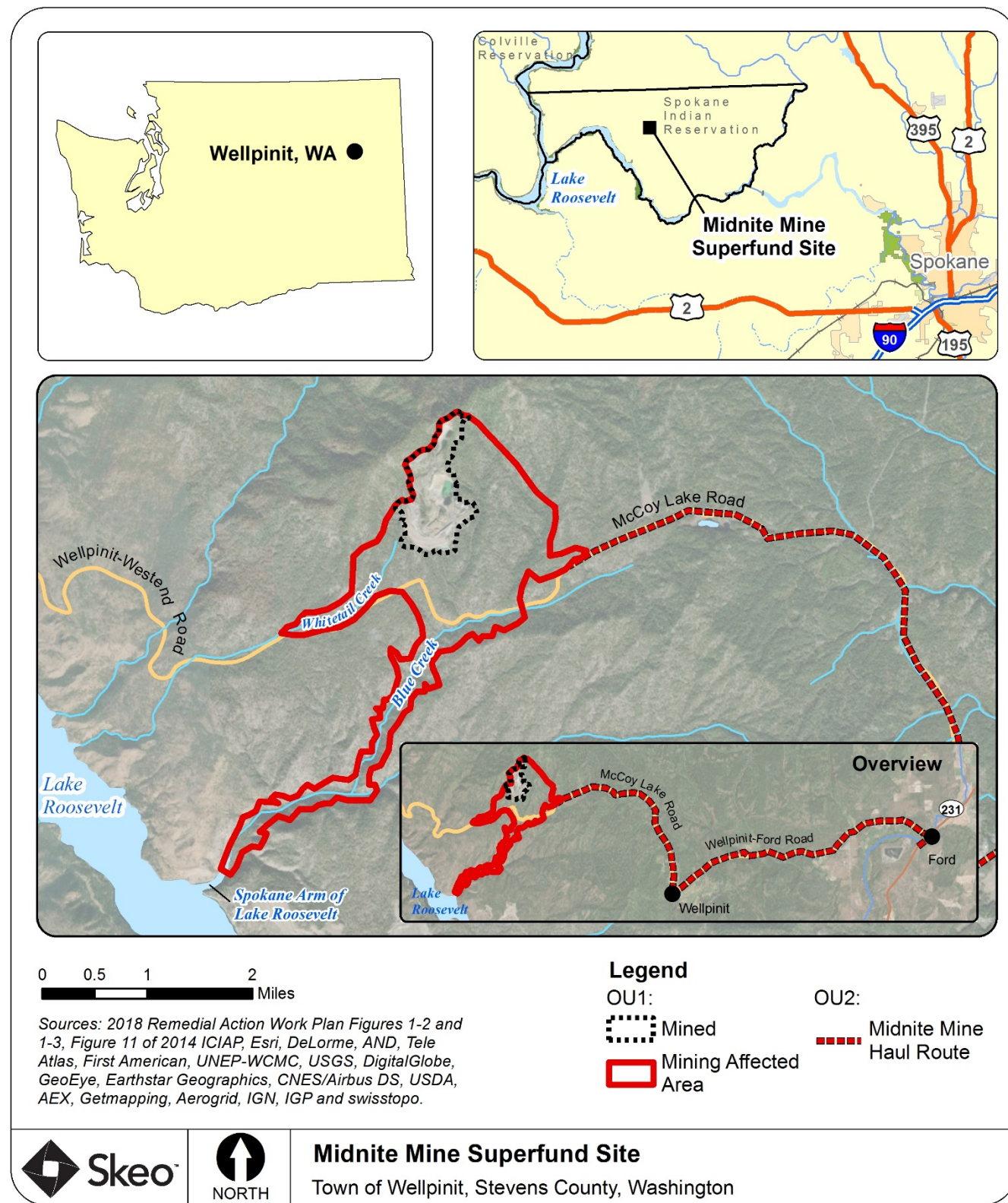
Two open pits (Pits 3 and 4), former Pits 1 and 2 (currently the backfilled pit area), waste rock piles and several

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<sup>1</sup> OU2 includes the area within the easement or right of way of the segment of the McCoy Lake-Wellpinit and the Ford-Wellpinit Roads between the Western Haul Road at the mine and the Dawn Mill access road.

stockpiles remain on site and remediation is underway (Figure 2). Most of the Site drains south to Blue Creek, which enters the Spokane Arm of Franklin D. Roosevelt Lake (Lake Roosevelt) (Figure 1). A small area in the southwest Mined Area drains to Whitetail Creek, which also drains to Lake Roosevelt (Figure D-1 in Appendix D). Contaminated water emerging below the waste rock and ore piles is captured for treatment in an on-site water treatment plant (WTP). Groundwater flow is generally to the south from higher-elevation recharge areas to lower-elevation discharge areas, including Blue Creek. Groundwater occurs in the alluvial, unconsolidated material as well as bedrock. Groundwater recharge to the open and backfilled pits occurs by infiltration of precipitation and snowmelt, interflow along the bedrock surface to the pit walls, and flow from fractures in the bedrock. Groundwater is not currently used for drinking water in the affected areas. The Mined Area is fenced. Reservation lands surrounding the Site and Blue Creek are mostly used for wildlife management, forestry, recreation, hunting and other tribal subsistence activities. Allotments and fee lands adjacent to the Mined Area have not been developed. Appendix A provides a list of additional site resources. Appendix B provides the Site's chronology of events.

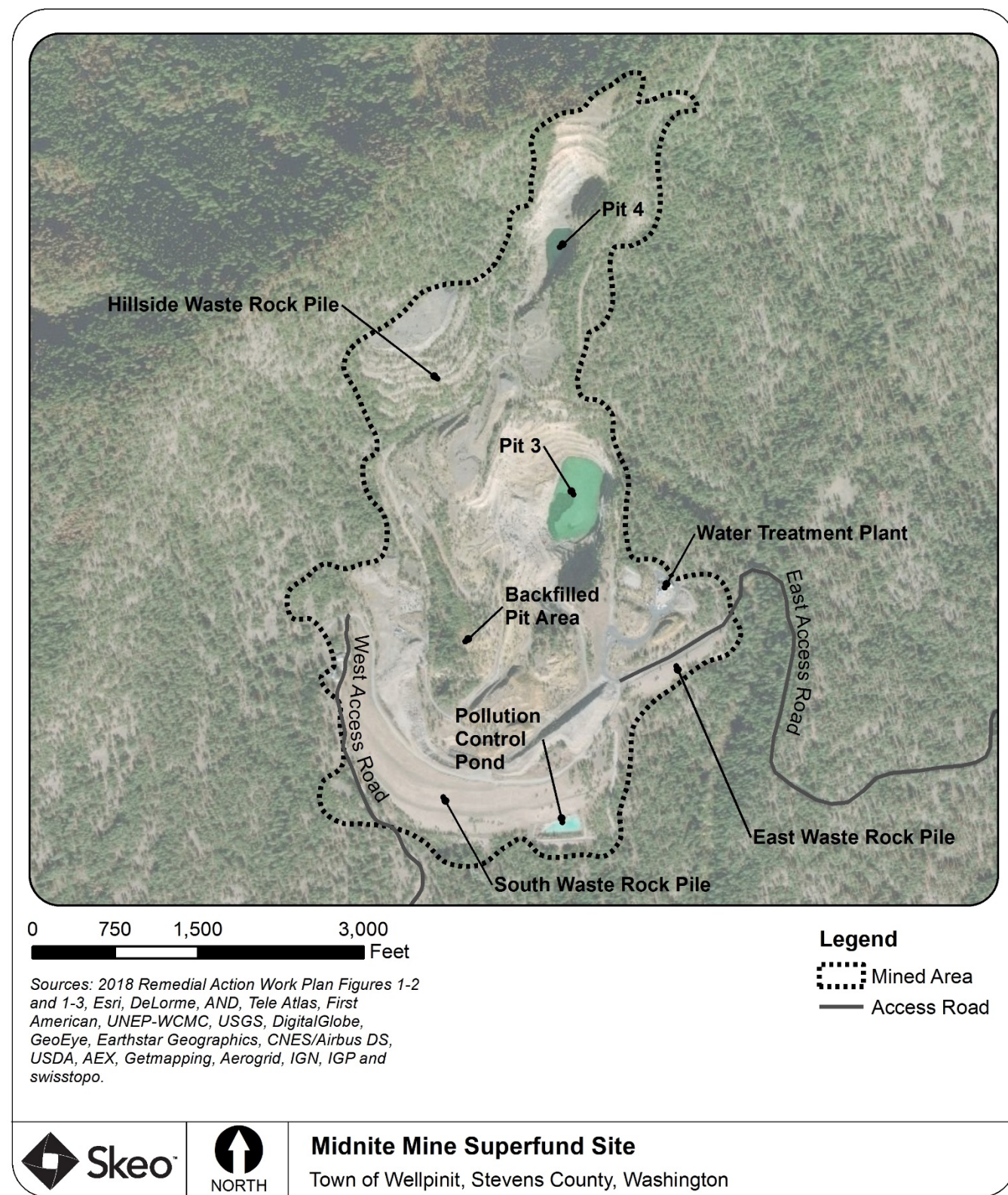
**Figure 1: Site Vicinity Map**



*Disclaimer:* This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.



**Figure 2: Detailed Site Map**



*Disclaimer:* This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

## **FIVE-YEAR REVIEW SUMMARY FORM**

<b>SITE IDENTIFICATION</b>		
<b>Site Name:</b> Midnite Mine		
<b>EPA ID:</b> WAD980978753		
<b>Region:</b> 10	<b>State:</b> WA	<b>City/County:</b> Wellpinit/Stevens
<b>SITE STATUS</b>		
<b>NPL Status:</b> Final		
<b>Multiple OUs?</b> Yes	<b>Has the Site achieved construction completion?</b> No	
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> EPA		
<b>Author name:</b> Joe Wallace, with additional support provided by Skeo		
<b>Author affiliation:</b> EPA Region 10		
<b>Review period:</b> 8/21/2018 – 5/1/2019		
<b>Date of site inspection:</b> 9/11/2018		
<b>Type of review:</b> Statutory		
<b>Review number:</b> 2		
<b>Triggering action date:</b> 4/18/2014		
<b>Due date</b> ( <i>five years after triggering action date</i> ): 4/18/2019		

## **II. RESPONSE ACTION SUMMARY**

### **Basis for Taking Action**

In 1954, Spokane Tribe members and prospectors found uranium in an area of the Spokane Tribe of Indians Reservation and formed Midnite Mines, Inc. Midnite Mines, Inc. then joined with Newmont Mining Company (Newmont) to create the Dawn Mining Company (Dawn). Newmont is the company's majority shareholder.

EPA proposed the Site for listing on the Superfund program's National Priorities List (NPL) in February 1999. EPA initiated a Fund-financed remedial investigation and feasibility study (RI/FS) in 1999. EPA listed the Site on the NPL in May 2000.

Hazardous substances released at the Site as a result of mining include metals and radionuclides that exceed background in various media. Contaminants of concern (COCs) were selected based on future risk to human health under subsistence or recreational use scenarios in the Mined Area and the Mining Affected Areas and cultural and subsistence uses of Blue Creek and/or ecological risk to aquatic, riparian/wetland and terrestrial ecosystems in the Mined Area and drainages south of the Mined Area (Table 1).

**Table 1: COCs, by Media**

COC	Media
Uranium Lead-210 Radium-226	Surface Material
Uranium-238 Uranium-234 Manganese Uranium (total)	Groundwater
Lead-210 Uranium-238 Uranium-234 Radium-226 Chromium Manganese Selenium Uranium (total) Vanadium	Sediment
Lead-210 Uranium-238 Uranium-234 Aluminum (total) Barium (total) Beryllium (total) Cadmium (dissolved) Cobalt (total) Copper (dissolved) Lead (dissolved) Manganese (total) Nickel (dissolved) Silver (dissolved) Uranium (total) Zinc (dissolved)	Surface Water

**Response Actions**

In 2004, Dawn performed a removal action to address spilled ore detectable by radiation scans adjacent to the Midnite Mine Haul Route (OU2). The ore debris was excavated from areas of public access and staged in OU1 with the other waste rock.

EPA signed the Site's Record of Decision (ROD) in September 2006. The ROD selected the remedy for OU1 and OU2. The ROD addresses soils, groundwater, sediment and surface water at OU1. The ROD addresses OU2 soils by incorporating the removal action along the Haul Route into the final remedial action for the Site. The selected remedy establishes institutional controls to ensure that future excavation or other ground disturbance along the paved road does not pose unacceptable human health or environmental risks. The remedial action objectives (RAOs) for contaminated media at the Site are provided in Table 2.

**Table 2: RAOs, by Media**

Media	RAOs
Surface materials (soil, ore, proto-ore, waste rock, overburden and materials used in haul road construction) Sediments (pits, ponds, creeks and drainages)	<ul style="list-style-type: none"> <li>• Reduce exposure of humans and ecological receptor populations to COCs in and radiation from mining-affected surface materials and sediments to levels that do not result in unacceptable site-related risks.</li> <li>• Reduce loadings of COCs from surface materials and sediments to surface water and groundwater so that loadings do not result in unacceptable site-related risks.</li> <li>• Reduce environmental transport of mining-affected surface material from the Mined Area to areas outside of the Mined Area. Prevent people from removing mining-affected surface material.</li> </ul>
Surface water (seeps and water in pits, ponds and other surface impoundments and in creeks and drainages)	<ul style="list-style-type: none"> <li>• Reduce exposure of humans and ecological receptor populations to COCs in surface water to levels that do not result in unacceptable site-related risks.</li> <li>• Reduce infiltration of surface water into acid rock drainage-generating materials and reduce erosion and environmental transport of mining-affected surface materials by surface water.</li> <li>• Reduce loadings of COCs from surface water to groundwater so that loadings do not result in unacceptable site-related risks.</li> </ul>
Groundwater	<ul style="list-style-type: none"> <li>• Reduce exposure of humans to COCs in groundwater to levels that do not result in unacceptable site-related risks.</li> <li>• Reduce loadings of COCs from groundwater to surface water so that loadings do not result in unacceptable site-related risks.</li> </ul>
Air	<ul style="list-style-type: none"> <li>• Reduce exposure of humans to radon-222 or its decay products by limiting the average radon-222 release rate from radioactive materials to levels that do not result in unacceptable site-related risk.</li> </ul>

The major components of the selected remedy include:

1. Containment of mine waste in pits
  - Excavation of above-grade mine waste, including waste rock, ore and proto-ore, stored mine cores, road gravel, contaminated soil, and pit and drainage sediment. It does not include waste rock in the Backfilled Pit Area.
  - Consolidation of excavated mine waste into Pit 3 and Pit 4 to create waste containment areas with a sump, drainage layer and liner.
  - Contouring waste in Pits 3 and 4 and waste in the Backfilled Pit Area and vegetated cover to minimize infiltration and meet cleanup levels for each containment area.
2. Water collection and treatment
  - During waste containment activities, continued collection and treatment of contaminated seeps and pit water with on-site discharge of treated water in compliance with interim discharge limits.
  - After waste containment is completed, removal of water that enters Pit 3, Pit 4 and the Backfilled Pit Area using pumping wells and collection of any seeps that exceed surface water cleanup levels.
  - Design and construction of a replacement WTP and a conveyance for discharge of treated water directly to the Spokane River Arm of Lake Roosevelt.
  - Long-term discharge of treated water to the Spokane River Arm under a National Pollutant Discharge Elimination System (NPDES) permit.
3. Residuals management, including disposal of WTP sludge
4. Surface water and sediment management
  - Contouring, revegetation and surface water management in the drainage basin to divert clean water away from waste containment areas while minimizing erosion.
  - Construction of sediment controls in the mine drainages to prevent sediment transport downstream to Blue Creek.

- Monitoring of Blue Creek and delta areas to assess natural recovery and the need for active remediation.
- 5. Monitored natural attenuation (MNA) of groundwater
- 6. Institutional controls and access restrictions
  - OU1
    - Permanent institutional controls in waste containment areas and at the WTP to prevent groundwater use and protect the integrity of the remedy.
    - Physical access restrictions such as an interim fence and a permanent boulder barrier around containment areas to prevent damage to soil covers and to reduce risk.
    - Interim institutional controls to prevent extraction or use of groundwater until cleanup levels are met.
    - Interim measures, such as signs, advisories, and community outreach, to minimize public uses of surface water, sediment, and affected food plants outside the waste containment area until cleanup levels are met.
  - OU2
    - Permanent institutional controls at OU2 to ensure safety during excavation activities and ensure appropriate management of any ore debris identified during excavation.
- 7. Long-term site management
  - Monitoring to assess the effectiveness of the remedy, including physical inspections, revegetation surveys, groundwater and surface monitoring, radiation, and radon monitoring.
  - Operations and maintenance (O&M) of the WTP.
  - O&M of soil covers, wells and water conveyances, surface water controls and other remedy components.
- 8. Contingent actions to include:
  - Sediment cleanup in Blue Creek and Blue Creek delta if necessary.
  - Implementation of other enhancements to reduce acid rock drainage.

Cleanup levels were provided in the 2006 ROD for surface water, groundwater, surface material (soil and rock) and sediment (Table 3).<sup>2</sup>

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<sup>2</sup> Under the NCP, EPA is expected to select a remedy that achieves an excess human health cancer risk of between  $10^{-4}$  and  $10^{-6}$ . For the Midnite Mine Site, the cleanup levels are generally based on background levels rather than on concentrations based on risks, because most of the regulatory standards and risk-based concentrations for the Site are below background levels. Environmental media in un-impacted areas near the site contain naturally elevated levels of certain metals and radionuclides. Generally, under CERCLA, cleanup levels are not set at concentrations below natural background levels. (See Section 104[a][3][A] of CERCLA.) In some instances, such as the Spokane Tribe water quality standards, the regulatory standard itself allows for the use of background, as described below. Due to the known carcinogenic potency of radionuclides, fractional increases in concentrations of radionuclides can lead to a significant increase in risk. By setting background as the cleanup level, this remedy will reduce site-related risks to levels associated with natural conditions.

EPA guidance and policy do not recommend that cleanup levels be established at levels below background, even if the background level exceeds an applicable or relevant and appropriate requirements (ARAR) or risk-based concentration. Where a regulatory standard or risk-based concentration is greater than the background level, the standard or risk-based concentration is used as the cleanup level.



**Table 3: COC Cleanup Levels, by Media**

COC	ROD Cleanup Level	Risk Driver	Basis
Surface Water			
Lead-210	2.5 pCi/L	Human Health	Background
Uranium-238	7.6 pCi/L	Human Health	Background
Uranium-234	8.8 pCi/L	Human Health	Background
Aluminum (total)	9,073 µg/L	Ecological	Background
Barium (total)	165 µg/L	Ecological	Background
Beryllium (total)	0.53 µg/L	Ecological	Benchmark, EPA Regions 4 and 9
Cadmium (dissolved) <sup>a</sup>	2.0 µg/L (acute) 0.5 µg/L (chronic)	Ecological	NRWQC
Cobalt (total)	3 µg/L	Ecological	Background
Copper (dissolved) <sup>a</sup>	13.4 µg/L (acute) 8.96 µg/L (chronic)	Ecological	Spokane Tribe WQS
Lead (dissolved) <sup>a</sup>	64.6 µg/L (acute) 2.52 µg/L (chronic)	Ecological	Spokane Tribe WQS
Manganese (total)	72 µg/L	Human Health and Ecological	Background
Nickel (dissolved) <sup>a</sup>	468 µg/L (acute) 52 µg/L (chronic)	Ecological	Spokane Tribe WQS
Silver (dissolved)	3.2 µg/L (acute) 0.8 µg/L (chronic)	Ecological	NRWQC
Uranium (total)	19.6 µg/L	Human Health and Ecological	Background
Zinc (dissolved) <sup>a</sup>	114 µg/L (acute) 105 µg/L (chronic)	Ecological	Spokane Tribe WQS
Groundwater			
Uranium-238	35 pCi/L	Human Health	Background
Uranium-234	37 pCi/L	Human Health	Background
Manganese	1,990 µg/L	Human Health	Background
Uranium (total)	88 µg/L	Human Health	Background
Surface Material			
Uranium (total)	43 mg/kg	Human Health and Ecological	Background
Lead-210	7.5 pCi/kg	Human Health	Background
Radium-226	4.7 pCi/g	Human Health	Background
Sediment			
Lead-210	20 pCi/g	Human Health	Background
Uranium-238	31 pCi/g	Human Health	Background
Uranium-234	41 pCi/g	Human Health	Background
Radium-226	13 pCi/g	Human Health	Background
Chromium	43.4 mg/kg	Ecological	Spokane Tribe Sediment Standard
Manganese	1,179 mg/kg	Human Health and Ecological	Background
Selenium	1.7 mg/kg	Ecological	Background
Uranium (total)	93.2 mg/kg	Human Health and Ecological	Background
Vanadium	41 mg/kg	Ecological	Background

COC	ROD Cleanup Level	Risk Driver	Basis
<i>Notes:</i> µg/L = micrograms per liter pCi/L = picocuries per liter pCi/g = picocuries per gram pCi/kg = picocuries per kilogram mg/kg = milligrams per kilogram NRWQC = National Recommended Water Quality Criteria WQS = Water Quality Standard a = Criteria are hardness dependent. Cleanup level calculated at a hardness of 100 mg/L as calcium carbonate. Source: 2006 ROD, Tables 8-1 through 8-4			

### **Status of Implementation**

In November 2008, EPA issued a Unilateral Administrative Order for the Phase 1 remedial design and remedial action. In accordance with the Unilateral Administrative Order, Dawn and Newmont (the PRPs) continued to operate the WTP, fenced portions of the Site and performed interim measures to reduce contaminant loading to Blue Creek.

From May 2009 to January 2012, when a Consent Decree covering all required actions was entered by the court, Newmont performed interim actions, including fencing the remaining portions of the Site, improving surface water management, continued operation of the WTP, testing for WTP modifications and initial design investigations.

In January 2012, Dawn and Newmont initiated the remedial design and completed the 100% Basis of Design Report in October 2015. Site preparation work, including installation of contractor facilities, access road construction, stockpile relocation and work related to the Construction Support Zone, began in May 2016. Between 2016 and 2017, remedial action activities were managed and performed by a contractor to Newmont. In 2018, Newmont took over management of the remedial action activities.

Remedy implementation is ongoing, and the projected end date is 2025. Since the start of remediation, the main remedial activities include waste containment activities that have occurred in the West Access Road area, the Northern Construction Support Zone area and water removal and preparation of Pit 4 to receive waste (Figure D-2 in Appendix D).

#### *West Access Road Area*

Contaminated surface material was removed from the West Access Road area in 2016 and 2017 and stored on site in a temporary stockpile. Waste material will be added to Pit 4 after completion of the underdrain system. In order to verify compliance with the cleanup levels in removal areas at the West Access Road, the following activities were used for the Final Status Survey in accordance with the 2017 Final Status Survey Work Plan.

- Final status gamma radiation survey.
- Final status soil sampling and testing for radiological COCs applicable to surface material.
- Determination and documentation of exposed competent bedrock.

The complete criteria for evaluating compliance with cleanup levels are provided in Appendix C.

Final status gamma survey data were collected in two field efforts. The results showed over 95 percent of the West Access Road had gamma readings below 27 microroentgens per hour (µR/hr) and 100 percent of the West Access Road had gamma-based predictions of Radium-226 (Ra-226) concentrations below the 4.7 pCi/g cleanup level. One soil sampling result exceeded the Ra-226 cleanup level with a concentration of 5.8 pCi/g. A supplemental investigation was conducted and the hot spot was confirmed. Additional soil excavation was conducted in April 2017 and two soil samples were collected; the cleanup goal was met in both samples. Soil sample results for natural uranium (U-nat) and lead-210 (Pb-210) were below the respective cleanup levels in all

samples. Several areas were excavated to bedrock and gamma scans were conducted and the results met the compliance criteria. Final grading occurred in July and August 2017. Hydroseeding occurred in August 2017.

#### *Northern Construction Support Zone Area*

The Final Status Survey in the Northern Construction Support Zone consisted of two components:

1. Confirmation that all excavation in the Northern Construction Support Zone had been completed to bedrock.
2. Completion of gamma survey of the excavated area.

Excavation of soils in the Northern Construction Support Zone occurred in two phases. Initially, excavation of stockpiled materials and soil occurred in the fall of 2016 in all areas except where buildings and trash pits were encountered. Remaining soils were removed following removal of buildings and trash pits in 2017. In all excavated areas, soil excavations proceeded to bedrock because the gamma cutoff level for Ra-226 could not be achieved. Waste material is stored on site in temporary stockpiles and will be placed in Pit 4.

The final gamma survey was conducted in July 2017. As summarized in the 2017 Remedial Action report, following EPA approval of the Final Status Survey, interim stormwater stabilization measures were implemented in the Northern Construction Support Zone. This area will likely be regraded during construction of support facilities and possibly the new WTP.

During the cleanup work in the Northern Construction Support Zone, the PRPs found that that weathered surface material at the bottom of the excavations, believed to be naturally occurring and unimpacted by mining activities, contains Ra-226 concentrations above the cleanup level. This resulted in an increased amount of material excavated that will be disposed of in Pit 4. Newmont is concerned that the background-based cleanup levels established in the ROD may not reflect true background and could result in exceedance of the available disposal capacity in the Pits. In July 2018, Newmont requested EPA revise the cleanup levels for surface materials based on new information obtained during the cleanup actions in the Northern Construction Support Zone and West Access Road Area. See Appendix J for additional background information.

#### *Pit 4*

Activities at Pit 4 included:

- Rockfall protection, including catch berms, drapery and attenuation systems, were installed along the access road into the pit and the west, north and east faces of Pit 4.
- Dewatering started in 2016 and finished in May 2017. Water was pumped from Pit 4 to Pit 3.
- Sediment removal and sump excavation was conducted in August 2017 after the water level was lowered to allow access to the base of Pit 4.
- Following sediment removal, backfill of drain rock and drain gravel was initiated in August 2017 and is ongoing. Drain rock and gravel originates from the Hillside Waste Rock Pile and is processed in a crushing and screening plant located between the Hillside Waste Rock Pile and Pit 4.
- A horizontal dewatering system was installed at the base of Pit 4 as part of the Underdrain Sump system that conveys Pit 4 water to Pit 3 via gravity pipeline.

Appendix C provides a full list of all remedial activities conducted from 2016 to 2018.

Current remedial activities at the Site include ongoing WTP operation and continued placement of waste rock in Pit 4. Future remedial activities include dewatering and preparation of Pit 3, continued waste containment activities and construction of the new WTP. In 2017, a new NPDES permit was issued for treated water from the new WTP. The start of construction of the new WTP is scheduled for 2019.

## **Institutional Control (IC) Review**

As part of the selected remedy, institutional controls are required for the Midnite Mine containment area, areas supporting water treatment, and other remediated areas to prevent exposure and preserve the integrity of the remedy. Institutional controls for mine-affected groundwater, surface water, and sediment are also required until the cleanup objectives are met through MNA. Institutional controls have not been implemented yet, but the Institutional Controls Implementation and Assurance Plan (ICIAP) submitted in 2014 sets forth a plan for their implementation and assurance. In the interim, engineering controls and posted information signs ensure there are no completed exposure pathways. During and following the remedial action construction at OU1, excavations along OU2 haul route will be monitored in accordance with the Site-wide Monitoring Plan (SMP).

**Table 4: Summary of Planned and/or Implemented Institutional Controls (ICs)**

<b>Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions</b>	<b>ICs Needed</b>	<b>ICs Called for in the Decision Documents</b>	<b>Impacted Parcel(s)</b>	<b>IC Objective</b>	<b>Title of IC Instrument Implemented and Date (or planned)</b>
Groundwater	Yes	Yes	Mined Area (final area established based on post-remedy groundwater monitoring)	Prevent installation of wells for purposes other than monitoring or O&M, extraction of groundwater for drinking, irrigation or other consumptive practices.	Tribal ordinances, which may include zoning classifications, drilling permit requirements or other land-use planning documents (not yet implemented)
Surface water	Yes	Yes	Mined Area (final area established based on post-remedy surface water monitoring)	Prevent use of surface water for drinking, irrigation or other consumptive purposes and discourage subsistence plant, fish and wildlife harvesting within impacted waterways.	Tribal ordinances or health advisory (not yet implemented)
Mined Area	Yes	Yes	Areas with waste in place post-remedy	Prevent construction of any structure or vehicle use, excavation, well or boring installation, and vehicle access that may adversely impact the effectiveness of the remedy.	Government controls such as Tribal ordinances, environmental or restrictive covenants (not yet implemented)
Areas supporting water treatment	Yes	Yes	Area to be determined, pending final WTP construction	Prevent access to the WTP area except for purposes set forth in the O&M Plan or otherwise approved by EPA. Prevent activities that may damage or adversely affect activities associated with the WTP area (e.g., wells, pipes).	Tribal ordinances, instruments, including easements, rights of way, or licenses covering the areas outside of the Mined Area that support water treatment facilities (not yet implemented)

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Other remediated areas of the Site	Yes	Yes	To be determined	Prevent mining, water extraction or other development that is inconsistent with the remedy and that would compromise the achievement or maintenance of cleanup levels.	Tribal ordinances, such as zoning restrictions, land use prescriptions or building permit requirements (not yet implemented)
OU2	Yes	Yes	Area within the easement or right of way of the segment of the McCoy Lake-Wellpinit and the Ford-Wellpinit roads between the western haul road at the mine and the Dawn Mill access road	Ensure public and worker safety during any excavation activities along the road by following appropriate monitoring and safety provisions and ensure appropriate management of ore debris identified during excavation.	To be developed in coordination with Spokane Tribe and other entities as appropriate (not yet implemented)
Source: 2014 ICIAP					

### **Systems Operations/Operation and Maintenance**

O&M is conducted in accordance with the 2018 O&M Plan, which includes O&M plans for the WTP at the Site, security fence, site access roads and culverts, surface water diversions, groundwater collection systems, and ponds and tanks. Other O&M plans will be incorporated as remedy construction progresses.

The existing interim water management system at the Site comprises seep and surface water collection systems (including pits/surface water impoundments), conveyance systems, a WTP, a WTP effluent pipeline system and WTP residuals management facilities. This system comprises the primary O&M activities at the Site. The WTP is designed to run about 500 gallons per minute (gpm). The water treatment process involves the addition of barium chloride followed by lime precipitation. The precipitate is settled and centrifuged as sludge. Sulfuric acid addition brings the water back to approved pH before discharge to on-site surface water.

The primary activities associated with system operation include:

- Capture of mine-impacted water from discrete seeps and alluvial wells.
- Pumping of captured water to Pit 3 for storage.
- Pumping of water from Pit 3 to the WTP during WTP operation.
- Seasonal operation of the existing WTP (four 24-hour days a week, seven months per year).
- Off-site disposal of residuals from the water treatment process.
- Monitoring and reporting required by the NPDES permit for the WTP.
- Monitoring of surface water and groundwater quality pursuant to the Performance Monitoring Plan.

- Monthly inspection and necessary repairs of the fence.
- Routine and focused inspection and repair of site surface water management systems.

Routine maintenance and monitoring of the interim water management system is conducted at an interval in accordance with the 2018 O&M Plan. Activities are recorded in a daily operating log. Daily maintenance includes recording flow rate, pH, tank level, chemical additives, sampling times and any sludge disposal activities. Visual observations are also made daily on the seep and surface water collection locations. Weekly activities include alarm system and modem maintenance. Monthly discharge monitoring reports are generated containing WTP effluent total monthly flow, pH range and effluent concentrations.

The projected annual O&M cost for the water management system was estimated to be \$389,400 in the 2018 Remedial Action Work Plan (RAWP).

### III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR Report as well as the recommendations from the previous FYR Report and the status of those recommendations.

**Table 5: Protectiveness Determinations/Statements from the 2014 FYR Report**

OU #	Protectiveness Determination	Protectiveness Statement
1 and 2	Will be Protective	The remedy at OU1 and OU2 is expected to be protective of human health and the environment upon completion of the remedial actions and attainment of groundwater and surface water cleanup goals. In the interim, exposure pathways that could result in unacceptable risks are being controlled through access restrictions, warning signs, and the absence of groundwater wells in the area. Long term protectiveness will be achieved through the implementation of the remaining remedial actions, including consolidation of waste materials, institutional controls, and the construction of a new water treatment plant.

There were no issues or recommendations identified in the 2014 FYR Report.

### IV. FIVE-YEAR REVIEW PROCESS

#### Community Notification, Community Involvement and Site Interviews

A public notice was made available in the *Rawhide Press*, on 8/20/2018 (Appendix E). It stated that the FYR was underway and invited the public to submit any comments to EPA. The results of the review and the report will be made available at the EPA's website <https://www.epa.gov/superfund/midnite-mine>. The Site repository was closed during this FYR period and EPA is working with the Spokane Tribe of Indians to reestablish a local information repository.

During the FYR process, requests for interviews were sent out to the community through various contact lists held by both EPA the Spokane Tribe of Indians. EPA participated in a community meeting in Wellpinit on 10/26/18 and asked community members to provide input pertinent to the Site. Several community members provided input to EPA via email. The community members indicated they feel there is a lack of communication about the Site and request more transparency on the decision-making procedures occurring at the Site and between Newmont and EPA. A community member also expressed concern about the potential increase in the Ra-226 background cleanup level and requested that an independent analysis of the current and proposed background cleanup level for Ra-226. The community member also requested information repositories be updated.

A representative from Spokane Riverkeeper indicated that more community outreach should be conducted to keep interested and affected parties updated on Site activities. The representative also expressed concern about the ecological and human health effects from mining activities on Blue Creek and the confluence of Blue Creek and the Spokane River. The interview response is included in Appendix F.

No additional completed interview forms or requests to participate in interviews were completed.

## **Data Review**

Data collected during this FYR period include site-wide monitoring activities conducted in accordance with the SMP updated in April 2018. These activities include groundwater, surface water, WTP effluent and air quality monitoring. Groundwater, surface water and air monitoring has been conducted since the remedial action began in 2016. WTP effluent monitoring has occurred at the Site since the WTP began operating in 1995. Verification sampling was also conducted in the West Access Road and the Northern Construction Support Zone. The results of the verification sampling are described in the Status of Implementation section of this FYR.

### *Site-Wide Remedial Action Monitoring*

The objectives of the site-wide monitoring are as follows:

1. Determine if contaminants are released from the Mined Area to the downgradient area during the remedy implementation.
2. Determine if cleanup levels are being achieved within a reasonable timeframe following remedy implementation.
3. Provide data to support protectiveness determination during and after remedy implementation.

Since remedy implementation is ongoing, this FYR only evaluates the first and third objective of the site-wide monitoring program. To determine if the objectives are met, environmental media samples are analyzed for indicator parameters and compared to action levels determined in the 2018 SMP. The indicator parameters for surface water and groundwater include pH, specific conductivity, sulfate, uranium, manganese and Rd-226. The indicator parameters for sediment will be the COCs established in the ROD. The action levels are the upper prediction limits calculated from historical data for each sampling location. If historical data are not sufficient to calculate upper prediction limits, qualitative action levels or trends are utilized until enough data are collected to calculate upper prediction limits.

If concentrations of indicator parameters remain stable or decrease during remedial action construction, then no adjustments to the Site's engineering controls and water management system is needed. If concentrations exceed action levels during remedial action construction, then further evaluation will be conducted, including confirmation sampling, visual inspection of the engineering controls, and/or comparison with upgradient data. Alternate actions will be implemented if needed.

### **Groundwater**

In accordance with the 2018 SMP, groundwater monitoring consists of semi-annual sampling in the second and fourth quarter and water-level monitoring in the regolith and bedrock wells downgradient of the Mined Area. Regolith (alluvial, unconsolidated zone) and bedrock wells are shown in Figures D-3 and D-4 in Appendix D. Two wells are sampled quarterly (GW-36A and GW-54). The most recent sampling event was conducted between February and May 2018. Samples were collected from 28 locations. Action levels for groundwater were provided in the 2015 SMP and re-calculated in the 2018 SMP. Five wells currently have enough historical data to allow calculation of the upper prediction limit. These wells are GW-19 (central drainage regolith), GW-35A (western drainage regolith), GW-36A (central drainage regolith), GW-50 (western drainage bedrock) and GW-51 (central drainage bedrock). Action level exceedances and the subsequent response actions are based on the quarterly and semi-annual reports submitted by the PRPs.

**Table 6: Groundwater Exceedances, 2016 to 2018**

Year	Quarter	Indicator Parameter	Location	Result	Action Level	Planned Action
2016	4	pH <sup>a</sup>	GW-35A GW-36A	4.01 6.00	4.127 6.02	None
2017	2	Sulfate <sup>b</sup>	GW-50	461 <sup>d</sup> (446)	411 <sup>e</sup>	None
	4	Sulfate <sup>b</sup>	GW-50	499	408.4 <sup>e</sup>	Continued monitoring for upward trend
2018	2	Sulfate <sup>b</sup>	GW-50/494 (487)/490	494 (487)	490	None
		pH <sup>a</sup>	GW-36A GW-50	6.01(6.71) 6.82(7.15)	6.24 7.07	
		Conductivity <sup>c</sup>	GW-50/1,063(1,002)/1,058	1,063(1,002)	1,058	

*Notes:*

Season 1 = Q2 (April to June)

Season 2 = Q4 (October to December)

(446) = Resampling result

a = Reported in standard units

b = Reported in milligrams per liter dissolved

c = Reported in microsiemens per centimeter

d = Value represents the higher concentration of the parent sample and the duplicate sample

e = Action levels established in 2015 SMP. The current (2018) Quarter 4 action level for sulfate in GW-50 is 486.

As shown in Table 6, two wells had action level exceedances during the first half sampling event in 2018. However, after resampling, all results were within the action levels. There is no indication in the 2018 Semi-Annual Monitoring Report that any qualitative trend analysis is occurring for the other wells in the monitoring program that do not have established action levels. Historic data are not provided in the monitoring reports. In order to effectively track whether the ongoing remedy is meeting SMP objectives, the monitoring reports should provide historical trends for the wells for which there are no established action levels. Once the remedial action construction is completed, groundwater MNA monitoring will begin.

Surface Water and Sediment

Surface water sampling is conducted semi-annually in the drainages downgradient of the Mined Area, Blue Creek, existing seeps, and active impoundments and pits. Sediment sampling is conducted in the drainages downgradient of the Mined Area. Surface water and sediment monitoring locations are shown on Figure D-5 in Appendix D.

The most recent surface water sampling event was conducted between February and May 2018. Samples were collected from 18 out of 20 locations specified in the SMP. Two locations could not be sampled due to field conditions. Action levels for surface water were calculated in the 2015 SMP and re-calculated in the 2018 SMP. Seven locations currently have sufficient historical data to allow for calculation of the upper prediction limits: SW-2 (Eastern Drainage), SW-5 (Blue Creek downgradient of the Site), SW-6 (Mine Drainage), SW-7 (Blue Creek downgradient of the Site), SW-11 (Eastern Drainage contribution to SW-6), SW-12 (Central Drainage) and WDAC (Western Drainage seep).

Surface water sampling locations SW-2, SW-5, SW-6, SW-7 and SW-11 have two action levels – one for when the WTP is operating (on) and one for when the WTP is not operating (off). Surface water sampling locations SW-12 and WDAC have four action levels based on when the sample is collected (Quarter 1/January, Quarter 2/April, Quarter 3/July, Quarter 4/October). Table 7 includes the action level exceedances from 2016 to 2018. The exceedances were only slightly above action levels and continued monitoring in 2018 indicates results were within action levels when accounting for laboratory precision.



**Table 7: Surface Water Action Level Exceedances, 2016 to 2018**

Year	Quarter	Indicator Parameter	Location/Result/Action Level	Result	Action Level	Planned Action
2016	3	pH <sup>a</sup>	SW-5	6.0	6.89	None
2017	4	Total Manganese <sup>b</sup>	SW-7	0.048	0.042	
		Total Rd-226 <sup>c</sup>	SW-5	0.6	0.5	
		pH <sup>a</sup>	SW-6 SW-12	5.59 4.85	6.05 4.90	
2018	1	Total Rd-226 <sup>c</sup>	SW-6 SW-7	0.7 +/-0.2 0.7 +/-0.2	0.63 0.69	
		pH <sup>a</sup>	SW-7	6.55	6.59	
<i>Notes:</i> a = Reported in standard units b = Reported in milligrams per liter c = Reported in picocuries per liter						

Sediment samples are collected annually in Quarter 4 from 10 locations. Sample results from Quarter 4 of 2016 were within action levels established in the 2018 SMP, except for total manganese, total uranium, U-234 and U-238 from location SW-12. A re-sampling event was conducted in June 2017 from SW-12 and the results were within action levels. For the 2017 annual sampling event, all results were within action levels (Table 8).

**Table 8: Sediment Action Level Exceedances, 2016 to 2018**

Year	Quarter	Indicator Parameter	Location	Result	Action Level	Planned Action
2016	4	Manganese <sup>a</sup>	SW-12	102,000 (895)	77,350	None, all resampled results within action levels
		Uranium <sup>a</sup>	SW-12	6,070 (2,000)	5,441	
		U-234 <sup>b</sup>	SW-12	1,280 (540)	1,187	
		U-238 <sup>b</sup>	SW-12	1,130 (526)	1,074	
<i>Notes:</i> (895) = Resampling result a = Reported in milligrams per kilograms total dry weight b = Reported in picocuries per gram total dry weight						

### Air

Air monitoring is conducted in accordance with the Dust Control and Air Quality Monitoring Plan to monitor and minimize fugitive dust emissions from remediation activities. Air monitoring consists of visual observations and real-time particulate monitoring. The objectives of the air monitoring are:

- No visible dust emissions.
- No measured airborne particulate concentrations exceeding thresholds indicating potentially hazardous concentrations of contaminants of potential concern (COPCs).

Real-time air monitoring is conducted during all remedial activities using a network of real-time total suspended particulate (TSP) air monitoring situated at six locations (three semi-permanent locations at the site perimeter and three roving monitors located downwind of active construction areas).

Air monitoring has been conducted since the remedial action started in May 2016. The TSP network monitors air quality and provides an alert when pre-set air quality thresholds are exceeded. Alerts trigger an investigation and further dust control measures if needed. Since May 2016, the only TSP exceedance alarms attributable to dust were recorded during crushing and screening operations in the summer of 2017 (June through September). Dust

generation during the crushing and screening operation was mitigated in real time through use of water spray nozzles at each belt drop point during the plant operations. If needed, production was slowed to reduce dust concentrations to allowable levels. False alarms were also observed due to fog, rain and wildfire smoke. In October 2017, EPA approved the request to discontinue air monitoring during the winter when construction activities are not occurring.

#### WTP Effluent

The WTP generally operates from April to October, shutting down in the winter. Annual discharge volumes are provided in Table 9. A review of the annual cumulative pumping flow indicates volumes are consistent and there is no loss of water in the system; therefore the system is operating as designed.

**Table 9: WTP Discharge Volumes, 2016 to 2018**

Year	Western Drainage to Pollution Control Pond Volume	Pollution Control Pond to Pit 3 Volume	Pit 3 to WTP Volume	WTP Treated Volume (million gallons)
2016 <sup>a</sup>	31.67	42.03	66.79	64.0
2017 <sup>b</sup>	34.6	70.95	82.71	66.86
2018 <sup>c</sup>	27.95	36.4	27.98	22.9
<p><i>Notes:</i>  a = Source: Table 9 and Table 10, 2016 Site Wide Monitoring Program, Fourth Quarter Data Transmittal Report  b = Source: Table 9 and Table 10, 2017 Site Wide Monitoring Program, Fourth Quarter Data Transmittal Report  c = Source: Table 7 and Table 8; only includes April through July 2018, as reported in the 2018 First Half Data Transmittal Report</p>				

#### NPDES Discharge monitoring

Outfall 004 is the designated discharge point for treated effluent water from the WTP. Effluent from the Outfall 004 discharges to the East Drainage which discharges to Blue Creek (see Figure D-1 in Appendix D for drainages). Newmont monitors the discharge from Outfall 004 in accordance with the current NPDES permit. There were no exceedances of the discharge permit limits during this FYR period.

#### Non-Discharged Effluent monitoring

Effluent water from the WTP that is not discharged to Outfall 004 is utilized for remedial action construction activities in accordance with the 2018 Construction Water Management Plan. Water quality requirements are dependent on where the water will be used. On-site water is utilized in contaminated areas for dust suppression. On-site water is required to meet the WTP discharge standards. A reverse-osmosis treatment system was constructed in 2017 and commissioned in 2018 to further treat effluent from the WTP for use as off-site water. Off-site water is utilized for construction-related activities in uncontaminated and remediated areas.

Data are compared to on-site and off-site water quality standards and summarized in monthly construction reports starting in June 2018. In June, a total of 1,363,700 gallons of on-site water was utilized. In July, a total of 2,483,900 gallons of on-site water and 11,000 gallons of off-site water was utilized. There were no exceedances of the on-site and off-site water quality standards in June or July 2018.

#### Biomonitoring

In September 2018, a contractor for Dawn performed toxicity testing on the discharged effluent in accordance with the NPDES permit. The chronic biomonitoring is conducted to test the aquatic toxicity of the WTP discharge. The test measures significant differences in lethality and in reproduction and growth between control organism and organisms exposed to the effluent from Outfall 004. The results of the biomonitoring indicated that the sample passed the whole effluent toxicity permit limitations for this sampling period.

### **Site Inspection**

The FYR site inspection took place on 9/11/2018. Participants included EPA RPM Joe Wallace, Randy Connolly, Joni Wynecoop and Ricky Sherwood from the Spokane Tribe of Indians, William Lyle from Newmont and Louis Miller from Worthington Miller Environmental (Newmont's support contractor), Lee First of the Spokane River Keepers and Treat Suomi and Alison Cattani from EPA support contractor Skeo. The purpose of the inspection was to assess the protectiveness of the previously implemented remedy components as well as the ongoing remedial actions.

Site inspection participants entered the Site through a locked and staffed entrance gate. The gate and fence were in good condition. After a safety briefing, participants toured the Site. Participants observed the completed remedial action at West Haul Road and the Northern Construction Support Zone and the ongoing remedial actions at Pit 4. Site inspection participants then observed the WTP. Following the tour, site inspection participants also observed the signage located along the road and near access points to Blue Creek. No issues were noted during the site inspection. The site inspection checklist and photographs are provided in Appendices G and H, respectively.

## **V. TECHNICAL ASSESSMENT**

**QUESTION A:** Is the remedy functioning as intended by the decision documents?

### **Question A Summary:**

Yes; however, the OU1 remedy is still being implemented. OU1 remedy construction implementation will likely continue through 2025. The OU2 removal action is complete, but the institutional controls required in the 2006 OU1 and OU2 ROD has not been implemented.

During the OU1 remedy construction, the PRP is maintaining the access controls, including the fence and gated entrance, and monitoring environmental media to ensure no environmental or human health contaminant exposure is occurring.

The OU1 monitored media include air and dust, groundwater, surface water, sediment, and WTP effluent and discharge. During this FYR period, air monitoring activities have intermittently detected excess dust, although the PRP and their contractors respond in real time to address it. Groundwater, surface water and sediment monitoring indicate that generally contaminants are within action limits established in the RAWP and that there is no apparent increase in contaminant loading to the groundwater or surface water bodies on site. The existing WTP was built prior to the current remedy selection and will continue to operate until it is replaced by a new system. The existing WTP system is functioning as designed and meets current NPDES permit limits. WTP O&M is conducted regularly and there is no indication of system failure or inadequacy.

In the two areas that have been remediated in OU1, the West Access Road and the Northern Construction Support Zone, cleanup levels were attained or excavation proceeded to bedrock. OU2 removal action was completed in 2004. Institutional controls are required in accordance with the 2006 ROD and the 2014 ICIAP. They have not been implemented.

OU1 institutional controls are also outlined in the 2014 ICIAP, but have not yet been implemented. Several institutional controls, including proprietary controls and government controls, can be implemented prior to completion of remedy construction. EPA has not yet commented on the 2014 draft ICIAP. Once EPA provides comments and the plan is finalized, Dawn and Newmont will schedule a planning meeting with EPA and the Tribe to draft institutional controls that can be implemented prior to completion of the remedy construction activities. Some institutional controls for specific areas that will be remediated will be finalized after the final survey delineating any remaining contamination.

During remedy construction, there is a constant presence on site. The Tribe is a PRP and are aware of currently contaminated areas. Sitewide monitoring is conducted during the remedy construction activities to ensure the ongoing remedy construction is protective of human health and the environment. In the interim, the fence and

signage discourage use of surface water, and subsistence use of plants, fish and animals in and near areas potentially impacted by mining wastes (see Appendix H for photo). The Tribe has also erected signage along Blue Creek outside the Mined Area. Additionally, there is no current use of groundwater in the Mined Area, the Mining Affected Area or Blue Creek.

**QUESTION B:** Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

**Question B Summary:**

The exposure assumptions, toxicity data and RAOs used at the time of the remedy are still valid. The exposure assumptions were based on future subsistence and recreational uses of the Site, which are still appropriate. Current and anticipated future land use has not changed. The cleanup levels for groundwater, surface water, sediment and surface material were mostly based on background. However, some surface water and one sediment cleanup goal are federally promulgated applicable or relevant and appropriate requirements (ARARs) based on EPA and tribal water quality standards. The ARARs specified in the 2006 ROD were compared to the currently promulgated ARARs in Appendix I, Tables I-1 and I-2. None of the current standards are more stringent than those specified in the 2006 ROD.

Most cleanup levels are based on site background, which has not changed. However, there is some indication that the calculated background level for Ra-226 in surface material may not be appropriate. Recent cleanup work in the Northern Construction Support Zone at the Site found that weathered surface material at the bottom of the excavations, believed to be naturally occurring and unimpacted by mining activities, contains Ra-226 concentrations above the cleanup level. This resulted in an increased amount of material excavated and to be disposed of in Pit 4, and continued excavation may exceed available disposal capacity. The PRPs are concerned that the background-based cleanup level does not truly represent background and have requested that EPA reevaluate it. EPA, the Spokane Tribe of Indians and Newmont are currently evaluating if the Ra-226 cleanup goal should be revised to more accurately reflect the natural background concentrations near the Site. Any changes resulting from the reevaluation should be documented in a decision document.

**QUESTION C:** Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the OU1 or OU2 remedies.

## **VI. ISSUES/RECOMMENDATIONS**

<b>Issues/Recommendations</b>	
<b>OU(s) without Issues/Recommendations Identified in the FYR:</b>	
<i>OU1 and OU2</i>	

### **OTHER FINDINGS**

An additional recommendation was identified during the FYR. This recommendation does not affect current and/or future protectiveness.

- *The semi-annual monitoring reports should include some discussion on trends for the data collected at locations that do not have established action levels.*
- *The Site repository was closed during this FYR period and EPA is working with the Spokane Tribe of Indians to reestablish a local information repository.*

- *In the Northern Construction Support Zone, the PRPs excavated to bedrock and found Ra-226 at concentrations above the surface material cleanup level, which was established in the 2006 ROD based on background. This resulted in an increased amount of material excavated and to be disposed of in Pit 4, and continued excavation may exceed available disposal capacity. The PRPs are concerned that background-based cleanup level does not truly represent background and have requested that EPA reevaluate it. Any changes resulting from the reevaluation should be documented in a decision document.*
- *Community members have indicated an interest in receiving more site-related information. EPA will revise the Community Involvement Plan.*

## VII. PROTECTIVENESS STATEMENT

Protectiveness Statement	
<i>Operable Unit:</i> 1	<i>Protectiveness Determination:</i> Will be Protective
<i>Protectiveness Statement:</i> The remedy at OU1 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have addressed exposure pathways that could result in unacceptable risks through access restrictions, warning signs, and the absence of potable groundwater wells in the area.	

Protectiveness Statement	
<i>Operable Unit:</i> 2	<i>Protectiveness Determination:</i> Will be Protective
<i>Protectiveness Statement:</i> The remedy at OU2 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have addressed exposure pathways that could result in unacceptable risks and excavations along OU2 will be monitored in accordance with the Site-wide Monitoring Plan.	

## VIII. NEXT REVIEW

The next FYR Report for the Midnite Mine Superfund site is required five years from the completion date of this review.

## **APPENDIX A – REFERENCE LIST**

100 Percent Design Basis of Design Report, Midnite Mine Superfund Site. Prepared by MWH Americas, Inc. October 2015.

Air Quality and Meteorological Network at Midnite Mine Superfund Site, Stevens County, Quarterly Monitoring Report No. 1, Second Quarter 2016. Prepared by Bison Engineering, Inc. August 2016.

Air Quality and Meteorological Network at Midnite Mine Superfund Site, Stevens County, Quarterly Monitoring Report No. 2, Third Quarter 2016. Prepared by Bison Engineering, Inc. November 2016.

Air Quality and Meteorological Network at Midnite Mine Superfund Site, Stevens County, Quarterly Monitoring Report No. 3, Fourth Quarter 2016. Prepared by Bison Engineering, Inc. February 2017.

Air Quality and Meteorological Network at Midnite Mine Superfund Site, Stevens County, Quarterly Monitoring Report No. 4, First Quarter 2017. Prepared by Bison Engineering, Inc. May 2017.

Completion Report for Removal of Ore Debris Along the Ford-Wellpinit Haul Road. Prepared by MFG, Inc. March 2005.

Construction Completion Report, Midnite Mine Remedial Action Backfilled Pits Area. Prepared by Miller Geotechnical Consultants. February 2012.

Dust Control and Air Quality Monitoring Plan for Remedial Action at Midnite Mine Superfund Site, Stevens County, WA. Prepared by Dawn Mining Company, LLC. January 27, 2016.

Ecological Risk Assessment, Midnite Mine Site, Wellpinit, Washington. Prepared by Lockheed Martin. September 2005.

Five-Year Review Report, Midnite Mine Superfund Site, Spokane Indian Reservation, Stevens County, Washington. EPA Region 10. April 2014.

Midnite Mine Feasibility Study Report. EPA Region 10. September 2005.

Midnite Mine Human Health Risk Assessment Report. EPA Region 10. September 2005.

Midnite Mine Institutional Control Implementation and Assurance Plan, Revision 1. Prepared by MWH. February 21, 2014.

Midnite Mine 2016 Site Wide Monitoring Program, Third Quarter Data Transmittal Report. Prepared by Worthington Miller Environmental, LLC. October 2016.

Midnite Mine 2016 Site Wide Monitoring Program, Fourth Quarter Data Transmittal Report. Prepared by Worthington Miller Environmental, LLC. April 2017.

Midnite Mine 2017 Site Wide Monitoring Program, First Quarter Data Transmittal Report. Prepared by Worthington Miller Environmental, LLC. July 2017.

Midnite Mine 2017 Site Wide Monitoring Program, Second Quarter Data Transmittal Report. Prepared by Worthington Miller Environmental, LLC. October 2017.

Midnite Mine 2017 Site Wide Monitoring Program, Third Quarter Data Transmittal Report. Prepared by Worthington Miller Environmental, LLC. December 2017.

Midnite Mine 2017 Site Wide Monitoring Program, Fourth Quarter Data Transmittal Report. Prepared by Worthington Miller Environmental, LLC. April 2018.

Midnite Mine Site Wide Monitoring Program, 2018 First Half Data Transmittal Report. Prepared by Worthington Miller Environmental, LLC. August 2018.

Midnite Mine Monthly Reports – May 2016 through July 2018, Midnite Mine Superfund Site, Spokane Indian Reservation, Washington.

Midnite Mine 2017 Remedial Action Summary Report, Revision 1. Prepared by Stantec. April 2018.

Midnite Mine 2016 Remedial Action Summary Report, Revision 1. Prepared by Stantec. March 2017.

Midnite Mine Remedial Investigation Report. EPA Region 10. September 2005.

Operation, Maintenance and Monitoring (OM&M) Plan for the Midnite Mine Water Collection System and Water Treatment Plant for the Phase I RD/RA: Interim Water Management for the Midnite Mine – Revision 3. Prepared by Worthington Miller Environmental, LLC. January 31, 2014.

Record of Decision, Midnite Mine Superfund Site, Spokane Indian Reservation, Washington. EPA Region 10. September 2006.

Remedial Action Work Plan, Revision 5, Midnite Mine Superfund Site. Prepared by Stantec Consulting Services, Inc. and Worthington Miller Environmental, LLC. April 2018.

Summary of Information related to Background Concentrations of Contaminants of Concern in Surface Material and Calculation of the Cleanup Level for Radium-226 in the Record of Decision (2006), Midnite Mine Superfund Site, Spokane Indian Reservation, WA. Prepared by EPA. December 2017.

## APPENDIX B – SITE CHRONOLOGY

**Table B-1: Site Chronology**

Event	Date
Mine operated (except for an inactive period from 1965 to 1969)	1954 -1981
BIA terminated the mining lease held by Dawn Mining Company	1991
Start of water treatment pursuant to 1985 NPDES permit	1992
EPA listed the Site on the NPL	May 11, 2000
Mining companies removed detectable ore debris from the road between Midnite Mine and Ford Mill, pursuant to Administrative Order on Consent for OU2	March 24, 2005
EPA completed the RI/FS	September 30, 2005
EPA signed the OU1 and OU2 ROD	September 29, 2006
CERCLA Order requiring interim work (Phase 1 remedial design and remedial action), including continued water treatment and residuals management, surface water management upgrades, site fencing, and pre-design studies	November 2008
Seasonal start of existing water treatment system on site, now under CERCLA authorities (Phase 1 of remedial action and date that triggers a FYR)	May 2009
Ongoing water treatment, interim work to improve surface water management, site fencing and initial pre-design investigations	November 2008 through January 2012
Consent Decree finalizing settlement for responsible party performance of remedy entered by Federal Court	January 2012
Additional pre-design investigations	2012 -2014
Newmont and Dawn issued the Final Basis of Design Report	October 2015
Remedial action initiated	November 2, 2015
EPA issued memorandum clarifying the basis for the surface material for the cleanup level for Ra-226 (See Appendix J of this FYR)	January 16, 2018



## **APPENDIX C – REMEDIAL ACTION CONSTRUCTION ACTIVITIES**

### **2016<sup>3</sup>**

- East Access Road maintenance and improvements.
- Temporary administrative support area installation.
- Construction of staging and storage areas, including the initial laydown yard and the primary laydown yard.
- Construction of the equipment fueling and storage area.
- Temporary construction of the water supply, storage and distribution facilities.
- Establishment of the Temporary Impacted Soil Stockpile.
- Removal of mine-impacted material from the West Access Road area.
- Removal of mine-impacted material from the Northern Construction Support Zone.
- Pit 4 scaling, dewatering and preparation for backfill.
- Development of the drain material processing area.
- Development of the South Waste Rock Pile area.
- Construction of new access road.
- Monitoring well abandonment.
- Asbestos investigation and removal in the Man Camp Area Building.

### **2017<sup>4</sup>**

- Completed West Access Road remediation, including Final Status Survey, final grading and hydroseeding.
- Completed Northern Construction Support Zone remediation, including further excavation to bedrock, Final Status Survey, and delineation of the excavated area to prevent potential cross-contamination and unauthorized access.
- Man Camp demolition.
- Installation of rockfall protection at Pit 4.
- Continued dewatering at Pit 4.
- Pit 4 sediment removal and underdrain sump excavation completed.
- Placement of drain rock, drain gravel and horizontal dewatering system at Pit 4.
- Operation of the crushing and screening plan to process Pit 4 construction materials.

### **2018<sup>5</sup>**

- Continued dewatering of Pit 4.
- Completed construction of the reverse osmosis facility to produce off-site water.
- Continued placement of drain rock and drainage gravel at Pit 4.
- Completed installation of the Pit 4 Underliner System and Waste Rock Dewatering System.
- Continued placement of waste rock in Pit 4, including the extension of the Underdrain Risers and Waste Rock Dewatering Risers.

#### **Criteria for Evaluation of Compliance with Cleanup Levels**

The criteria for evaluation of compliance with cleanup levels based on the Final Status Survey data are summarized below. If either step 1 or 2 are not achieved, additional remediation will occur and the area will be retested in accordance with the criteria.

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<sup>3</sup> Source: Midnite Mine 2016 Remedial Action Summary Report, March 2017.

<sup>4</sup> Source: Midnite Mine 2017 Remedial Action Summary Report, April 2018.

<sup>5</sup> Source: 2018 Monthly Reports – January through July.

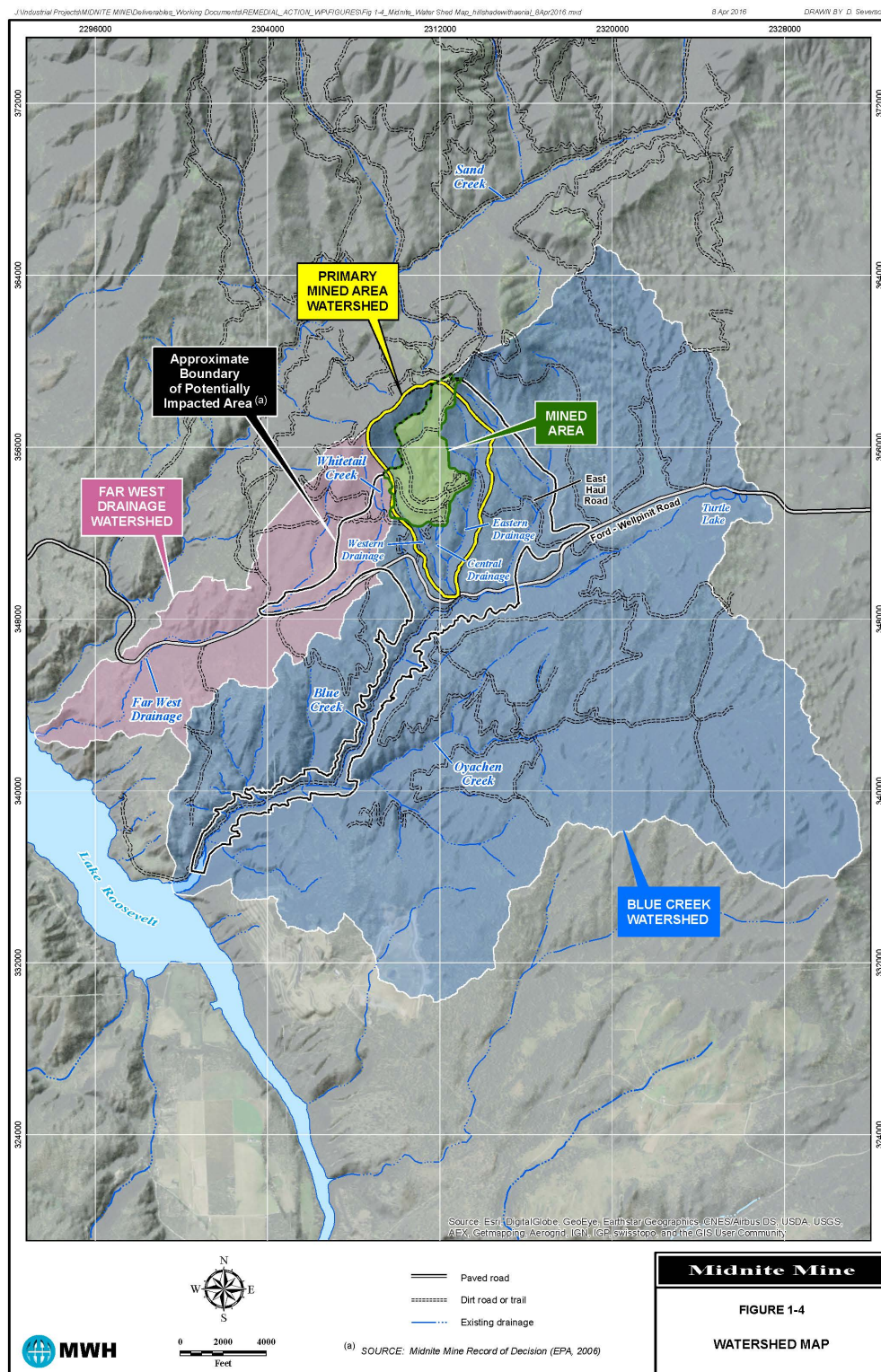
1. At least 95 percent of gamma readings across the survey unit are less than or equal to the gamma cutoff level of 27  $\mu\text{R/hr}$ <sup>6</sup>.
2. At least 95 percent of predicted Ra-226 concentrations in surface materials are less than or equal to the cleanup level (4.7 pCi/g).
3. All sampling results for Ra-226 concentrations must be less than or equal to the Ra-226 cleanup level. If any sample exceeds the Ra-226 cleanup level, a secondary investigation will be conducted. If a hot spot exists, the area will be remediated to cleanup levels, re-surveyed and resampled.
4. At least 95 percent of the analysis results for U-nat and Pb-210 are less than or equal to the respective cleanup levels (43 mg/kg and 7.5 pCi/g).
5. No single sampling result for U-nat or Pb-210 exceeds twice the cleanup level.
6. Exposed bedrock will not be evaluated in a context of compliance with cleanup levels but gamma scans will be conducted to document gamma readings above the exposed bedrock.

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<sup>6</sup> Gamma cutoff levels are designed to provide a 95 percent statistical probability of compliance with the 2006 ROD regarding cleanup levels for Ra-226 in surface materials (4.7 pCi/g) and sediments (13 pCi/g). A gamma cutoff level of 27  $\mu\text{R/hr}$  is measured using a radiation detection instrument to demonstrate that remediation has achieved the Ra-226 cleanup levels in surface materials.

## APPENDIX D – SITE MAPS

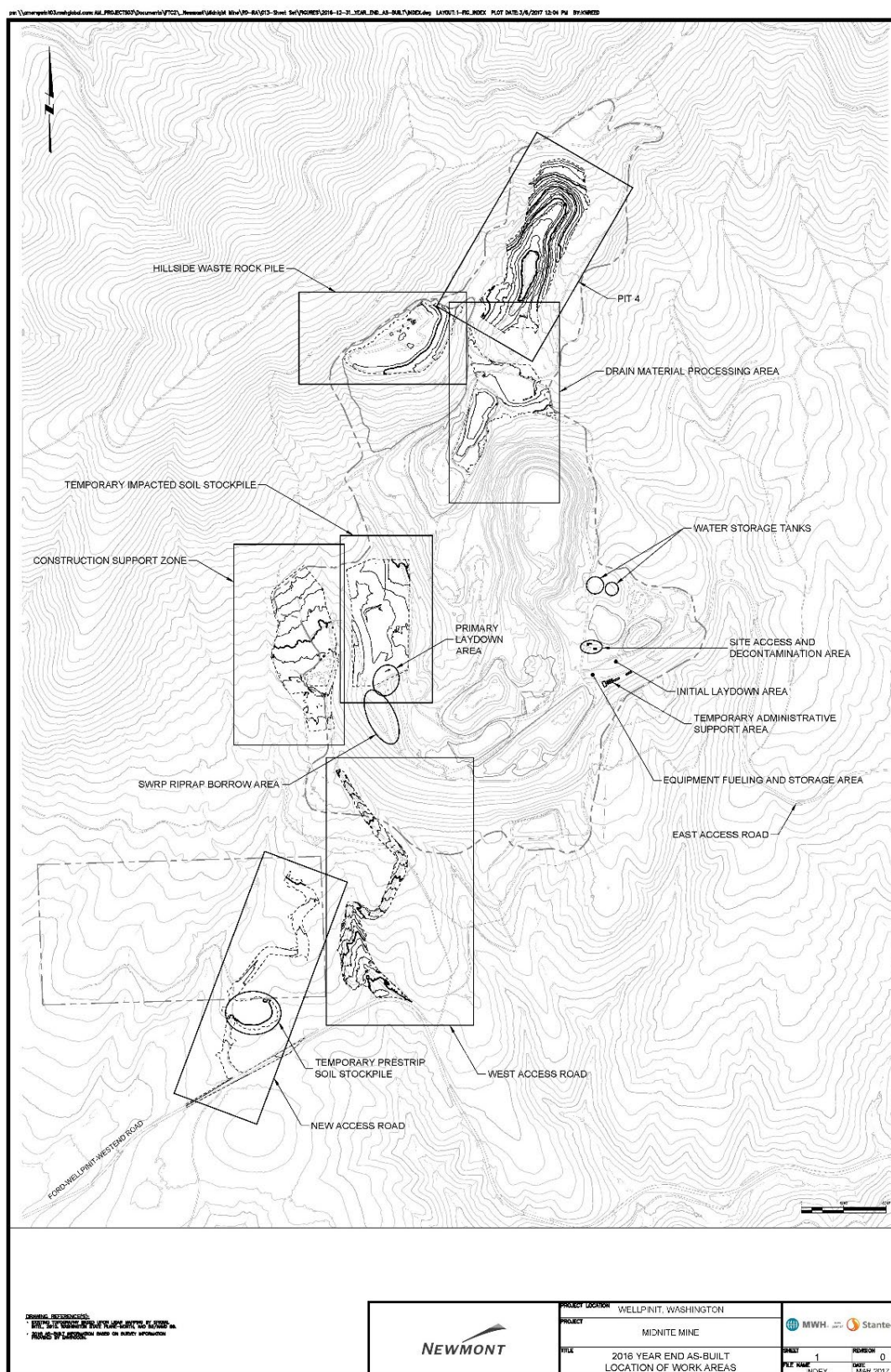
Figure D-1: Watershed Map<sup>7</sup>



<sup>7</sup> Source: 2018 RAWP



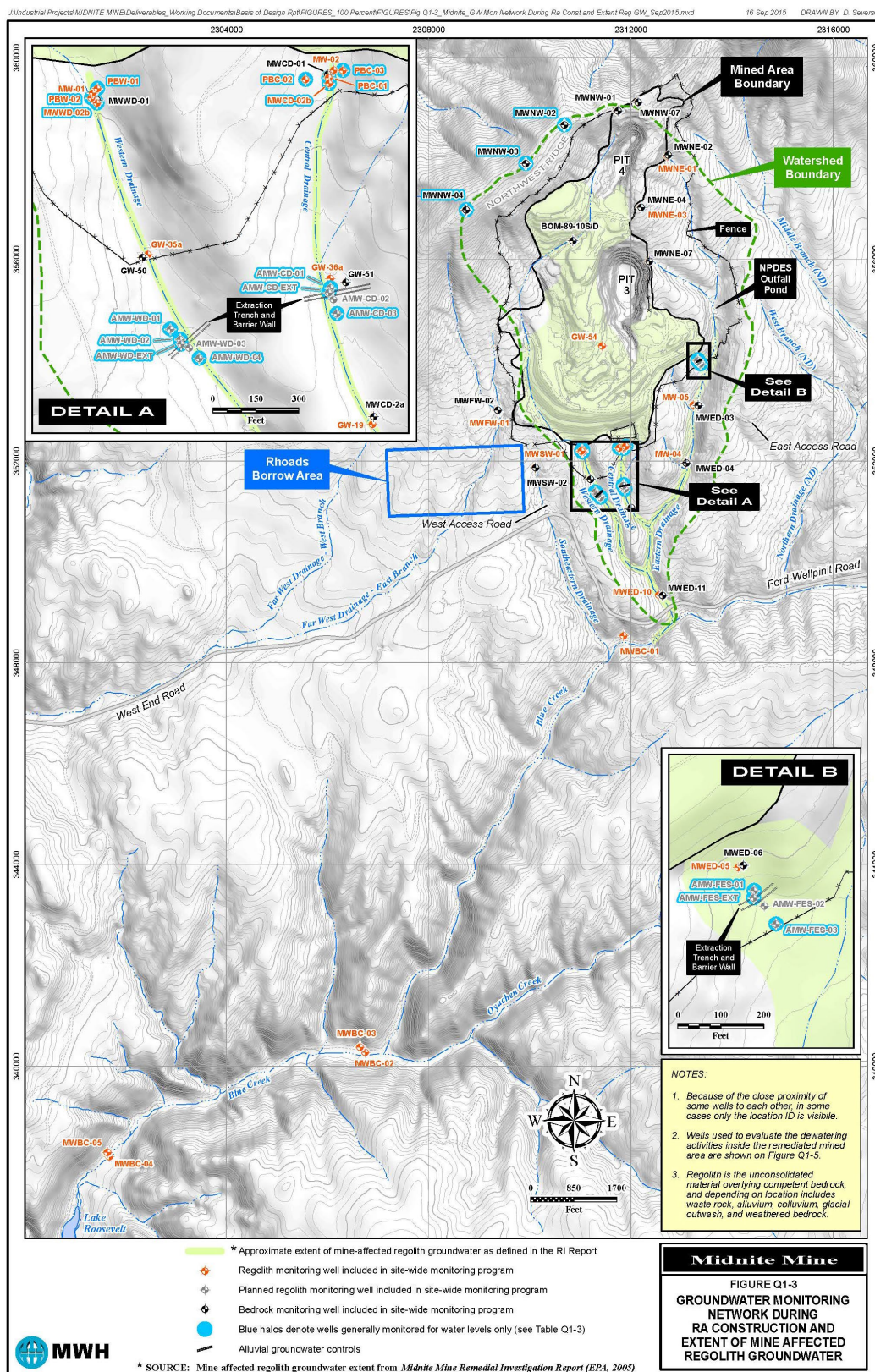
**Figure D-2: West Access Road and Northern Construction Support Zone Areas<sup>8</sup>**



<sup>8</sup> Source: 2016 Remedial Action Summary Report



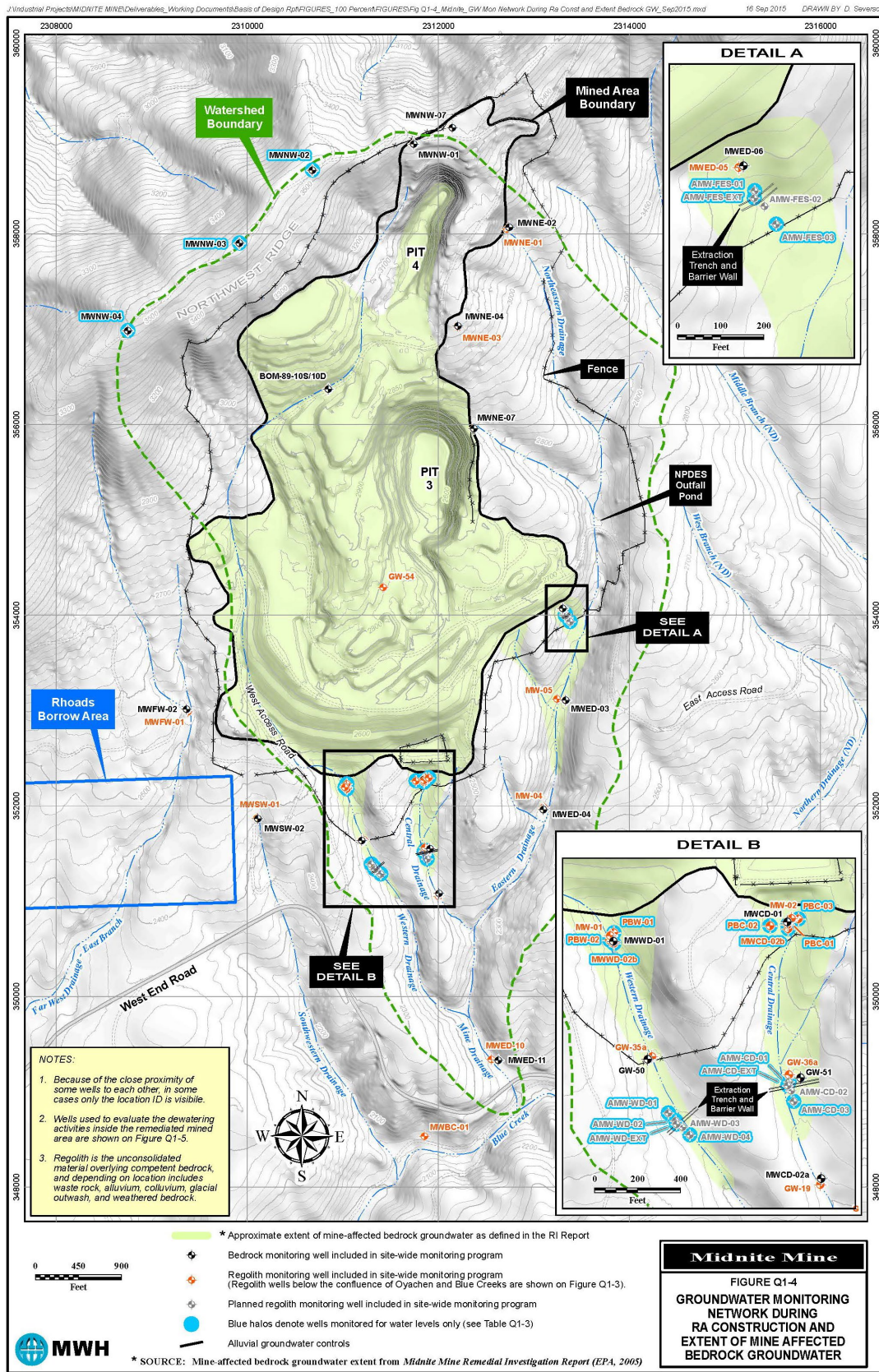
**Figure D-3: Regolith Groundwater Monitoring Network<sup>9</sup>**



<sup>9</sup> Source: 2018 Sitewide Monitoring Plan



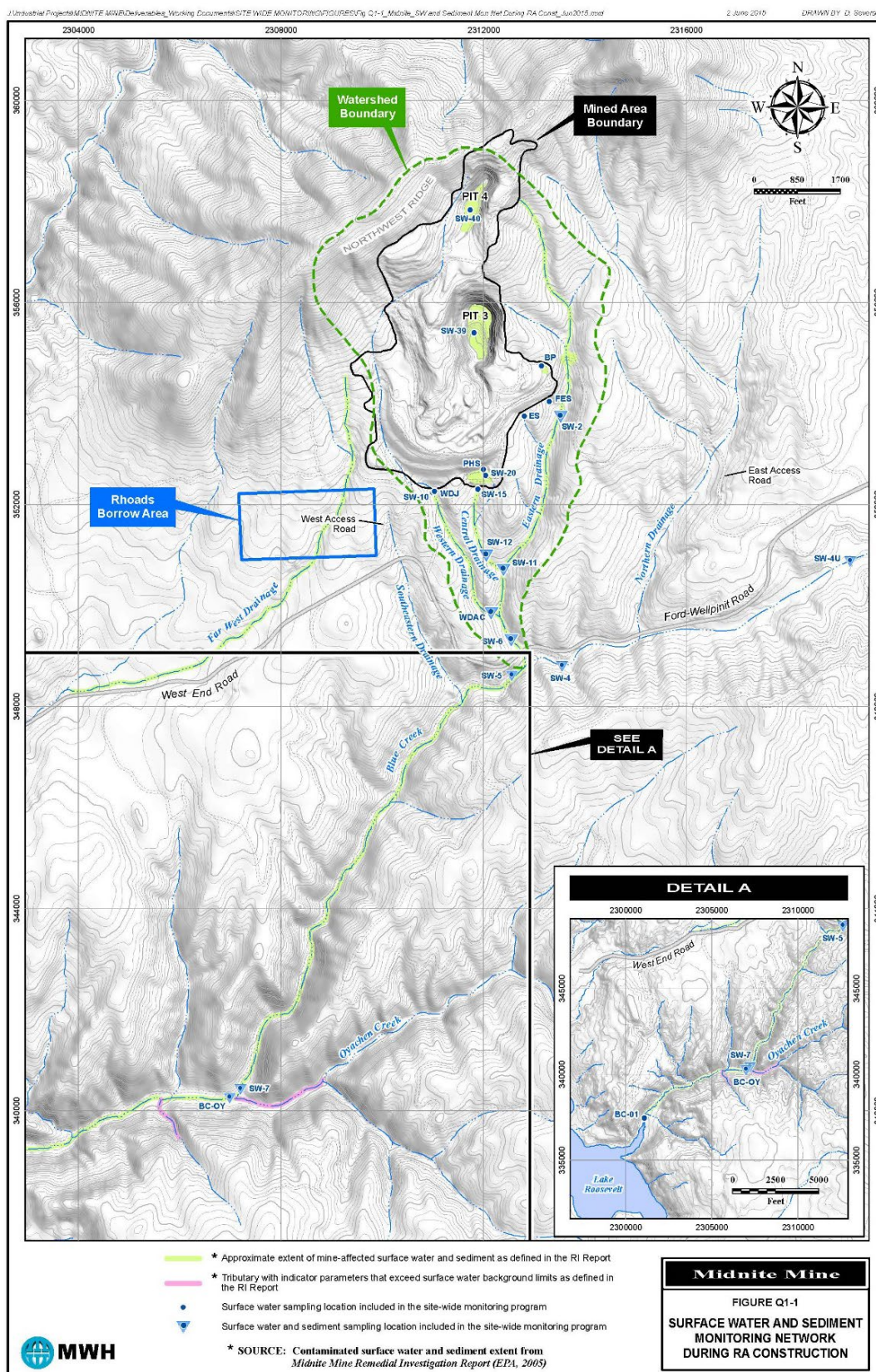
**Figure D-4: Bedrock Groundwater Monitoring Network<sup>10</sup>**



<sup>10</sup> Source: 2018 Sitewide Monitoring Plan



**Figure D-5: Surface Water and Sediment Monitoring Network<sup>11</sup>**



<sup>11</sup> Source: 2018 Sitewide Monitoring Plan

## APPENDIX E – PRESS NOTICE



# Cleanup Progress to be Reviewed for Midnite Mine, Wellpinit, WA Site Visit on September 11, 2018

### *We Want to Hear from You*

*As part of the site review, EPA's site team will be visiting the Midnite Mine on September 11, 2018. We like to keep the community informed about site activities. We also like to hear from you if you have any information or observations about the site that can help our review team. As part its five-year review process, EPA will be interviewing stakeholders and community members who have concerns, questions, or information about the site. If you would like to participate in an interview, or have any questions, **contact Joe Wallace**, EPA Project Manager, or Randy Connolly, Superfund Coordinator to the Spokane Tribe, **before September 11, 2018**.*

### *Want a community meeting?*

*Interested in the progress of the cleanup? Want to know more about the Midnite Mine? Ask for a meeting. If there is interest from the community, EPA will hold an open house and community meeting about the Midnite Mine cleanup. To be scheduled for a date and time after September 2018.*

### **Contacts:**

#### **Joe Wallace**

206-553-4470 or 800-424-4372 x 4470

[wallace.joe@epa.gov](mailto:wallace.joe@epa.gov)

#### **Randy Connolly**

509-626-4425

[randy.connolly@spokanetribe.com](mailto:randy.connolly@spokanetribe.com)

### **What and Why**

The U.S. Environmental Protection Agency will be reviewing the status of ongoing environmental cleanup activities at the Midnite Mine Superfund Site on the Spokane Indian Reservation near Wellpinit, Washington. The EPA is required to review Superfund sites every five years when contaminants remain on site or when cleanup activities are underway. The purpose of this review is to ensure that cleanup actions are progressing as planned to achieve the requirement to protect human health and the environment.

### **Background**

The Midnite Mine is an inactive uranium mine that operated from 1955 until 1981. Elevated levels of radioactivity and heavy metals in acid mine drainage pose a threat to human health and the environment. Stormwater runoff and contaminated groundwater from the site is treated at a waste water treatment plant under an EPA NPDES Permit. Treated water is discharged to Blue Creek, which enters the Spokane arm of Roosevelt Lake. Presently, cleanup activities are on-going.

### **More Information**

You can find useful information about the Midnite Mine at the EPA website:

<https://www.epa.gov/superfund/midnite-mine>

**TDD and/or TTY users may call the Federal Relay Service at 800-877-8339. Then please give the operator number (206) 553-4470, for Joe Wallace.**



## APPENDIX F – INTERVIEW FORMS

Dear Community Member,

Thank you for your interest in providing comments on the Midnight Mine Superfund Site during the Five-Year Review process. We like to hear from you if you have any information or observations about the site that can help our review team. Please answer the below questions and submit your responses by email or mail before October 15, 2018 to:

**Joe Wallace, EPA Project Manager**  
206-553-4470 or 800-424-4372 x 4470  
[wallace.joe@epa.gov](mailto:wallace.joe@epa.gov)

[Joe Wallace ECL-122, 1200 Sixth Avenue, Suite 155, Seattle, WA 98101](#)

If you would prefer to set up an interview by phone or email, please contact Joe Wallace by email or phone to schedule one.

### Midnite Mine Superfund Site

### Five-Year Review Interview Form

Subject Name: \_\_\_\_\_

Affiliation: \_\_\_\_\_

Spokane Riverkeeper

Date: 10/15/2018

1. Are you aware of the environmental issues at the Site and the cleanup activities that have taken place to date?  
**yes**
2. Are you aware of a proposal to change the cleanup levels at the Site? **yes**
3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism, trespassing, or safety issues? **no**
4. Are you aware of the safety measures for the site? **Yes** What is your opinion of them? **They seem adequate. BUT – has there ever been any monitoring of dust in the homes of the workers?**
5. How has this Site effected the surrounding community? **Blue Creek has been polluted with mine waste. Blue Creek is considered a sacred site among the Spokane Tribal members. Tribal members are no longer able to safely harvest roots, animals, plants from Blue Creek. It is unknown if contamination from the mine has affected the confluence of Blue Creek and the Spokane River.**
6. How is/has the Spokane Tribe been involved in the Site? **The Tribe has a Community Liason staff and a staff who works on Superfund Issues. I don't know how active these people have been, and/or if they've been effective at communicating the cleanup process with others.**
7. Are you aware of EPA efforts to keep involved parties and surrounding neighbors informed of activities at the Site? If so, how do you hear of site related activities? How can EPA best provide site-related information? **It appears that the information on the EPA portal is outdated. Not much information has been in the regional press (Spokesman Review). It appears that no articles have been published in the Spokesman Review for 3 years. Although I am new to this area and to this cleanup site – it appears to me that most people in the Spokane area know almost nothing about this site or it's cleanup. Is there a public participation plan for the site? Who is in charge of implementing it?**
8. What is your overall impression of the project, including cleanup, maintenance and plans for reuse (as appropriate)?
9. Do you have any comments, suggestions or recommendations regarding any aspects of the project? **There needs to be more effort into community outreach.**

- 10.** Would you be interested in attending a community meeting to discuss the progress of the cleanup at the Site?  
**I think there should be a community meeting in Wellpinit and Spokane about the proposed changes to the cleanup levels at this site.**

## APPENDIX G – SITE INSPECTION CHECKLIST

<b>FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST</b>			
<b>I. SITE INFORMATION</b>			
<b>Site Name:</b> <u>Midnite Mine</u>		<b>Date of Inspection:</b> <u>9/11/2018</u>	
<b>Location and Region:</b> <u>Wellpinit, WA 10</u>		<b>EPA ID:</b> <u>WAD980978753</u>	
<b>Agency, Office or Company Leading the Five-Year Review:</b> <u>EPA</u>		<b>Weather/Temperature:</b> <u>50s, cloudy</u>	
<b>Remedy Includes:</b> (Check all that apply) <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input checked="" type="checkbox"/> Landfill cover/containment  <input checked="" type="checkbox"/> Access controls  <input checked="" type="checkbox"/> Institutional controls  <input checked="" type="checkbox"/> Groundwater pump and treatment  <input checked="" type="checkbox"/> Surface water collection and treatment  <input type="checkbox"/> Other: _____ </div> <div style="width: 48%;"> <input checked="" type="checkbox"/> Monitored natural attenuation  <input type="checkbox"/> Groundwater containment  <input type="checkbox"/> Vertical barrier walls </div> </div>			
<b>Attachments:</b> <input type="checkbox"/> Inspection team roster attached <input checked="" type="checkbox"/> Site map attached			
<b>II. INTERVIEWS</b> (check all that apply)			
<b>1. O&amp;M Site Manager</b> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name _____</div> <div style="width: 30%;">Title _____</div> <div style="width: 30%;">Date _____</div> </div> <p>Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone : _____</p> <p>Problems, suggestions <input type="checkbox"/> Report attached: _____</p>			
<b>2. O&amp;M Staff</b> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name _____</div> <div style="width: 30%;">Title _____</div> <div style="width: 30%;">Date _____</div> </div> <p>Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone : _____</p> <p>Problems/suggestions <input type="checkbox"/> Report attached: _____</p>			
<b>3. Local Regulatory Authorities and Response Agencies</b> (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply. <div style="margin-top: 10px;"> Agency _____  Contact _____  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name _____</div> <div style="width: 30%;">Title _____</div> <div style="width: 20%;">Date _____</div> <div style="width: 20%;">Phone No. _____</div> </div> Problems/suggestions <input type="checkbox"/> Report attached: _____ </div> <div style="margin-top: 10px;"> Agency _____  Contact _____  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name _____</div> <div style="width: 30%;">Title _____</div> <div style="width: 20%;">Date _____</div> <div style="width: 20%;">Phone No. _____</div> </div> Problems/suggestions <input type="checkbox"/> Report attached: _____ </div> <div style="margin-top: 10px;"> Agency _____  Contact _____  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name _____</div> <div style="width: 30%;">Title _____</div> <div style="width: 20%;">Date _____</div> <div style="width: 20%;">Phone No. _____</div> </div> Problems/suggestions <input type="checkbox"/> Report attached: _____ </div> <div style="margin-top: 10px;"> Agency _____  Contact _____  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name _____</div> <div style="width: 30%;">Title _____</div> <div style="width: 20%;">Date _____</div> <div style="width: 20%;">Phone No. _____</div> </div> Problems/suggestions <input type="checkbox"/> Report attached: _____ </div> <div style="margin-top: 10px;"> Agency _____  Contact _____  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name _____</div> <div style="width: 30%;">Title _____</div> <div style="width: 20%;">Date _____</div> <div style="width: 20%;">Phone No. _____</div> </div> Problems/suggestions <input type="checkbox"/> Report attached: _____ </div>			

Name	Title	Date	Phone No.
Problems/suggestions <input type="checkbox"/> Report attached: _____			
4. <b>Other Interviews</b> (optional) <input type="checkbox"/> Report attached: _____			
<b>III. ON-SITE DOCUMENTS AND RECORDS VERIFIED</b> (check all that apply)			
1. <b>O&amp;M Documents</b>			
<input checked="" type="checkbox"/> O&M manual	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> As-built drawings	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Maintenance logs	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____			
2. <b>Site-Specific Health and Safety Plan</b>			
<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> Contingency plan/emergency response plan	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____			
3. <b>O&amp;M and OSHA Training Records</b>			
<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
Remarks: _____			
4. <b>Permits and Service Agreements</b>			
<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input checked="" type="checkbox"/> Effluent discharge	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Other permits: _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____			
5. <b>Gas Generation Records</b>			
<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
Remarks: _____			
6. <b>Settlement Monument Records</b>			
<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
Remarks: _____			
7. <b>Groundwater Monitoring Records</b>			
<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
Remarks: _____			
8. <b>Leachate Extraction Records</b>			
<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
Remarks: _____			
9. <b>Discharge Compliance Records</b>			
<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input checked="" type="checkbox"/> Water (effluent)	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____			
10. <b>Daily Access/Security Logs</b>			
<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
Remarks: _____			

<b>IV. O&amp;M COSTS</b>																																							
1.	<b>O&amp;M Organization</b> <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> State in-house  <input checked="" type="checkbox"/> PRP in-house  <input type="checkbox"/> Federal facility in-house  <input type="checkbox"/> _____ </div> <div> <input type="checkbox"/> Contractor for state  <input type="checkbox"/> Contractor for PRP  <input type="checkbox"/> Contractor for Federal facility </div> </div>																																						
2.	<b>O&amp;M Cost Records</b> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Funding mechanism/agreement in place <input type="checkbox"/> Unavailable </div> <p>Original O&amp;M cost estimate: _____ <input type="checkbox"/> Breakdown attached</p> <p style="text-align: center;">Total annual cost by year for review period if available</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">From: _____ Date</td> <td style="width: 25%;">To: _____ Date</td> <td style="width: 25%;">_____ Total cost</td> <td style="width: 25%; text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr><td colspan="4"> </td></tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr><td colspan="4"> </td></tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr><td colspan="4"> </td></tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr><td colspan="4"> </td></tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> </table>			From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached					From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached					From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached					From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached					From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached
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From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached																																				
3.	<b>Unanticipated or Unusually High O&amp;M Costs during Review Period</b> Describe costs and reasons: _____																																						
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A																																							
<b>A. Fencing</b>																																							
1.	<b>Fencing Damaged</b> <input checked="" type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A Remarks: <u>Inspected monthly, repairs performed as needed.</u>																																						
<b>B. Other Access Restrictions</b>																																							
1.	<b>Signs and Other Security Measures</b> <input checked="" type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A Remarks: <u>Signs located at entrance gate and near roads. Signs were also put up by Spokane Tribe of Indians at accessible water bodies near the mine boundary. See Institutional Controls section of this FYR Report.</u>																																						
<b>C. Institutional Controls (ICs) – Pending, ICIAP in review</b>																																							

<b>1. Implementation and Enforcement</b> Site conditions imply ICs not properly implemented <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A</span> Site conditions imply ICs not being fully enforced <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A</span> Type of monitoring (e.g., self-reporting, drive by): _____ Frequency: _____ Responsible party/agency: _____ Contact _____ <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <span>Name</span> <span>Title</span> <span>Date</span> <span>Phone no.</span> </div> Reporting is up to date <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A</span> Reports are verified by the lead agency <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A</span> Specific requirements in deed or decision documents have been met <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A</span> Violations have been reported <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A</span> Other problems or suggestions: <input checked="" type="checkbox"/> Report attached			
<b>2. Adequacy</b> <input type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <span style="float: right;"><input checked="" type="checkbox"/> N/A</span> Remarks: <u>Institutional controls will be implemented after remedy construction completion.</u>			
<b>D. General</b>			
<b>1. Vandalism/Trespassing</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident Remarks: _____			
<b>2. Land Use Changes On Site</b> <span style="float: right;"><input checked="" type="checkbox"/> N/A</span> Remarks: _____			
<b>3. Land Use Changes Off Site</b> <span style="float: right;"><input checked="" type="checkbox"/> N/A</span> Remarks: _____			
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>1. Roads Damaged</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A Remarks: _____			
<b>B. Other Site Conditions</b>			
Remarks: _____			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
<b>1. Settlement</b> (low spots) <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Area extent: _____ Depth: _____ Remarks: _____			
<b>2. Cracks</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Cracking not evident Lengths: _____ Widths: _____ Depths: _____ Remarks: _____			

3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	<b>Holes</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Holes not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	<b>Vegetative Cover</b>	<input type="checkbox"/> Grass	<input type="checkbox"/> Cover properly established
	<input type="checkbox"/> No signs of stress	<input type="checkbox"/> Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	<b>Alternative Cover</b> (e.g., armored rock, concrete)	<input type="checkbox"/> N/A	
	Remarks: _____		
7.	<b>Bulges</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	<b>Wet Areas/Water Damage</b>	<input type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Area extent: _____
	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Area extent: _____
	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Area extent: _____
	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Area extent: _____
	Remarks: _____		
9.	<b>Slope Instability</b>	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map
	<input type="checkbox"/> No evidence of slope instability		
	Area extent: _____		
	Remarks: _____		
<b>B. Benches</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks: _____		
2.	<b>Bench Breached</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks: _____		
3.	<b>Bench Overtopped</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks: _____		
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			

1.	<b>Settlement</b> (Low spots)	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation
	Material type: _____		Area extent: _____
	Remarks: _____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	<b>Obstructions</b>	Type: _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Area extent: _____	
	Size: _____		
	Remarks: _____		
6.	<b>Excessive Vegetative Growth</b>		Type: _____
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Area extent: _____	
	Remarks: _____		
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active	<input type="checkbox"/> Passive
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> Good condition
	<input type="checkbox"/> N/A		
	Remarks: _____		
2.	<b>Gas Monitoring Probes</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> Good condition
	<input type="checkbox"/> N/A		
	Remarks: _____		
3.	<b>Monitoring Wells</b> (within surface area of landfill)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> Good condition
	<input type="checkbox"/> N/A		
	Remarks: _____		
4.	<b>Extraction Wells Leachate</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Good condition		



<input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A	
Remarks: _____	
5.	<b>Settlement Monuments</b> <input type="checkbox"/> Located <input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
Remarks: _____	
<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance
Remarks: _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance
Remarks: _____	
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A
Remarks: _____	
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A
Remarks: _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A
Remarks: _____	
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Siltation</b> Area extent: _____         Depth: _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident
Remarks: _____	
2.	<b>Erosion</b> Area extent: _____         Depth: _____ <input type="checkbox"/> Erosion not evident
Remarks: _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A
Remarks: _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A
Remarks: _____	
<b>H. Retaining Walls</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Deformations</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Deformation not evident Horizontal displacement: _____         Vertical displacement: _____ Rotational displacement: _____
Remarks: _____	

2. <b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
Remarks: _____		
<b>I. Perimeter Ditches/Off-Site Discharge</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1. <b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
Area extent: _____		Depth: _____
Remarks: _____		
2. <b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
<input type="checkbox"/> Vegetation does not impede flow		
Area extent: _____		Type: _____
Remarks: _____		
3. <b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
Area extent: _____		Depth: _____
Remarks: _____		
4. <b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks: _____		
<b>VIII. VERTICAL BARRIER WALLS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1. <b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
Area extent: _____		Depth: _____
Remarks: _____		
2. <b>Performance Monitoring</b>	Type of monitoring: _____	
<input type="checkbox"/> Performance not monitored		
Frequency: _____	<input type="checkbox"/> Evidence of breaching	
Head differential: _____		
Remarks: _____		
<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
<b>A. Groundwater Extraction Wells, Pumps and Pipelines</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1. <b>Pumps, Wellhead Plumbing and Electrical</b>		
<input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A		
Remarks: _____		
2. <b>Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances</b>		
<input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance		
Remarks: _____		
3. <b>Spare Parts and Equipment</b>		
<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided		
Remarks: _____		
<b>B. Surface Water Collection Structures, Pumps and Pipelines</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		

1.	<b>Collection Structures, Pumps and Electrical</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks: _____
<b>C. Treatment System</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Treatment Train</b> (check components that apply) <input checked="" type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters: _____ <input checked="" type="checkbox"/> Additive (e.g., chelation agent, flocculent): <u>sulfuric acid, lime, barium chloride, flocculant polymer, antiscalant</u> <input type="checkbox"/> Others: _____ <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance <input checked="" type="checkbox"/> Sampling ports properly marked and functional <input checked="" type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input checked="" type="checkbox"/> Quantity of groundwater treated annually: <u>60 million gallons combined</u> <input checked="" type="checkbox"/> Quantity of surface water treated annually: <u>60 million gallons combined</u> Remarks: _____
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs maintenance Remarks: _____
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks: _____

<b>6. Monitoring Wells (pump and treatment remedy)</b> <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A Remarks: _____	
<b>D. Monitoring Data</b>	
<b>1. Monitoring Data</b> <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality	
<b>2. Monitoring Data Suggests:</b> <input type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining	
<b>E. Monitored Natural Attenuation</b>	
<b>1. Monitoring Wells (natural attenuation remedy)</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input checked="" type="checkbox"/> N/A Remarks: <u>MNA has not started.</u>	
<b>X. OTHER REMEDIES</b>	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
<b>XI. OVERALL OBSERVATIONS</b>	
<b>A. Implementation of the Remedy</b>	
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). <u>The 2006 remedy consists of mine waste containment, water treatment and institutional controls. The remedy is currently being implemented.</u>	
<b>B. Adequacy of O&amp;M</b>	
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>Current O&amp;M associated with the WTP is adequate.</u>	
<b>C. Early Indicators of Potential Remedy Problems</b>	
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>None.</u>	
<b>D. Opportunities for Optimization</b>	
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>None.</u>	

## APPENDIX H – SITE INSPECTION PHOTOS



Backfilling operations at Pit 4



Pump located at Pit 3





WTP building



On-site water holding tank, outside of WTP building





Monitoring wells located within fenced site area



Spokane Tribe of Indians signage outside of fenced site area

## APPENDIX I – DETAILED ARARS REVIEW TABLES

**Table I-1: Surface Water ARARs Review**

COCs	ROD ARARs (µg/L)	Current ARARs <sup>a</sup> (µg/L)	ARAR Change
Beryllium (total) <sup>b</sup>	0.53	93 (acute) <sup>c</sup> 11 (chronic) <sup>c</sup>	Less stringent
Cadmium (dissolved) <sup>b</sup>	2.0 (acute) 0.5 (chronic)	1.8 (acute) 0.72 (chronic)	No change
Copper (dissolved) <sup>b</sup>	13.4 (acute) 8.96 (chronic)	13 (acute) 9 (chronic)	No change
Lead (dissolved) <sup>b</sup>	64.6 (acute) 2.52 (chronic)	65 (acute) 2.5 (chronic)	No change
Nickel (dissolved) <sup>b</sup>	468 (acute) 52 (chronic)	470 (acute) 52 (chronic)	No change
Silver (dissolved) <sup>b</sup>	3.2 (acute) 0.8 (chronic)	3.2 (acute) -- (chronic)	No change (acute) No standard (chronic)
Zinc (dissolved) <sup>b</sup>	114 (acute) 105 (chronic)	110 (acute) 100 (chronic)	No change
<p><i>Notes:</i>  µg/L = micrograms per liter  a = Spokane Tribe WQS unless otherwise noted, located at <a href="https://www.epa.gov/sites/production/files/2014-12/documents/spokane-tribe-wqs.pdf">https://www.epa.gov/sites/production/files/2014-12/documents/spokane-tribe-wqs.pdf</a> (accessed 10/1/2018).  b = Criteria are hardness dependent. Cleanup level calculated at a hardness of 100 mg/L as calcium carbonate.  c = EPA Region 4 Ecological Risk Assessment Supplemental Guidance.  <a href="https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf">https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf</a> (accessed 10/1/2018).</p>			

**Table I-2: Sediment ARARs Review**

COCs	ROD ARARs (mg/kg)	Current ARARs <sup>a</sup> (mg/kg)	ARAR Change
Chromium <sup>b</sup>	43.4	43.4	No change
<p><i>Notes:</i>  mg/L = milligrams per liter  a = EPA Region 4 Ecological Risk Assessment Supplemental Guidance.  <a href="https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf">https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf</a> (accessed 10/1/2018).</p>			



## APPENDIX J – BACKGROUND CLEANUP LEVELS

### Background Information

The 2006 ROD identified a cleanup level of 4.7 pCi/g for Ra-226 in surface material. The cleanup level was defined by the 95 percent upper tolerance level (UTL) of background concentrations of Ra-226 in surface material from a nearby unimpacted area. During the RI/FS, background data on the COCs, including Ra-226, were obtained from two areas north of the Site, referred to as Background Area A and Background Area B. Twenty surface samples (0 to 2 inches) and eight subsurface samples (2 to 8 inches, collocated) were collected from each area.

The background surface material samples were collected in 2000 and analyzed from late 2000 to early 2001 for Ra-226 in the U.S. EPA National Air and Radiation Environmental Laboratory using gamma spectrometry following National Air and Radiation Environmental Laboratory Method GAM-01.

In 2017, EPA requested technical statistical support from an EPA oversight contractor to confirm the calculation of the ROD cleanup level of 4.7 pCi/g.<sup>12</sup> The 2017 analysis confirmed the ROD cleanup level for Ra-226 was calculated using background concentrations of Ra-226 from 16 subsurface samples. Background surface sample data for Ra-226 were not used to calculate the 95 percent UTL. It was also noted in the 2017 memorandum that the cleanup level for uranium in surface material was defined by the 95 percent UTL of pooled subsurface data, while the cleanup level for Pb-210 in surface material was defined by the 95 percent UTL of pooled surface data.

Recent cleanup excavations in the West Access Road and Northern Construction Support Zone identified surface materials at depths several feet below any area of visual impacts, which contained Ra-226 concentrations exceeding the cleanup level established for the Site.

Section 8.3 of the ROD notes that there are uncertainties in any determination of background and that future revisions to the background cleanup levels may be required.

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<sup>12</sup> Source: 2017 Summary of Information related to Background Concentrations of Contaminants of Concern in Surface Material and Calculation of the Cleanup Level for Radium-226 in the Record of Decision (2006). Midnite Mine Superfund Site. Prepared by EPA. December 2017.